



THE AMERICANA SUPPLEMENT

A Comprehensive Record of the Latest
Knowledge and Progress of the World,
Compiled by the Editorial Staff of the
Americana, assisted by expert authorities.

Complete in Two Volumes

THE SCIENTIFIC AMERICAN COMPILING DEPT

1911

THE AMERICANA

ICELAND. An island in the northern Baltic Sea. northwest from Denmark, and the most important colonial possession of that country. The area of Iceland is about 39,750 square miles, and population is approximately 80,000. The colony has the rights of autonomy, the charter under which the government is administered coming into effect in the year 1874. The constitution was amended in 1903. A Minister, appointed by the King of Denmark, stands at the head of the local government. He is assisted by the Althing, a legislative body of 40 members, of whom the people elect 34. The principal town of the island, and the seat of government, is Reykjavik. The trade of Iceland is almost altogether with its Protector. Exports from the colony to Denmark in 1908 were valued at about \$1,093,500, and the imports into the colony amounted to \$1,441,050; total exports, \$2,972,230; imports, \$9,548,550.

Ice Yachting. See **SPORTS**.

Idaho. A State of the Mountain Division of the United States with an area of 84,800 square miles, of which 510 square miles is water. The capital is Boise with a population of 17,358. The population of Idaho in 1910 was 325,594. This was an increase of 163,822, or 101.3 per cent, from 1900 to 1910. The population per square mile in 1910 was 3.9. Idaho ranks 45th in population.

Agriculture.—A great part of the State is naturally arid, but extensive irrigation works have been carried out and there are now 3,789 miles of canals supplying water for 3,266,386 acres. The Federal Government has completed 300 miles of canals covering 80,000 acres and has commenced operations which will involve an expenditure amounting to over \$7,000,000, for the reclamation of 266,100 acres. Statistics of the principal crops in 1910 were: Corn: acreage, 6,000 acres, production, 192,000 bushels; winter wheat: acreage, 345,000 acres, production, 8,176,000 bushels; spring wheat, acreage, 217,000 acres, production, 4,427,000 bushels; oats: acreage, 184,000 acres, production, 7,084,000 bushels; barley: acreage, 65,000 acres, production, 2,145,000 bushels; rye: acreage, 4,000 acres, production 80,000 bushels; potatoes: acreage, 24,000 acres, production, 3,408,000 bushels. Fruit and vegetables are also grown. There is an active live-stock industry, especially in sheep, the number of which in 1910 was put at 4,248,000, and the clip (1909) at 17,500,000 pounds. The State contains about 20,000,000 acres of national forest.

Mining and Manufactures.—The State has

rich deposits of gold, silver, and other metals. About 7,000 miners are employed. The copper output of the State in 1910, or in previous years, was mainly derived from the Snow Storm mine, of the Coeur d'Alene district. The upper smelter of the Lost Packer Mining Co at Ivers was idle in 1910. The production in 1909 of coal amounted to 4,553 short tons, valued at \$19,459, a decrease, as compared with 1908, of 876 tons in quantity and of \$2,373 in value. In 1908 the output of gold amounted to 69,829 fine ounces of the value of \$1,433,500; of silver, to 7,558,300 fine ounces of the value of \$4,042,900; copper 7,256,086 pounds (\$957,803); lead 98,464 short tons (\$8,270,976); zinc 581 short tons (\$54,614). Iron, nickel, cobalt, mica, phosphate, rock antimony, tungsten, granite, sandstone, limestone and lime, pumice and salt are worked more or less. Total value of mineral output in 1908, \$15,256,382. The chief industries are the working of lumber and timber, and flour and grist milling. Within the State there are 260 lumber mills; one at Potlatch is said to be the largest in the world and can cut 750,000 feet daily. Idaho has also 46 flour mills. The State contains 1,763 miles of railroad, besides 138 miles of electric railroad track.

Government.—The governor of Idaho is James H. Brady (1909-11), with a salary of \$5,000. The lieutenant-governor is Lewis H. Sweetzer, secretary of state, Robert Lansdon; treasurer, Charles A. Hastings; auditor S. D. Taylor; attorney-general, D. C. McDougall; superintendent of education, S. Belle Chamberlain; commissioner of insurance, C. D. Gosaland; superintendent of agriculture, J. P. Fallon—all Republicans. The Legislature has 76 members, of whom 23 are Senators, and 53 Representatives.

Finance.—For the year 1909, the receipts and disbursements were as follows: Receipts for 1909, \$1,300,000; disbursements for 1909, \$1,100,000. On 30 Sept. 1906, the State bonded debt amounted to \$1,750,000; sinking fund \$400,000, and the assessed value of real and personal property to \$120,000,000.

Religion and Education.—The population is largely Mormon, other religious denominations, in the order of their numbers, being Catholics, Methodists, Presbyterians, and Disciples or Christians. For supervision of the public schools there is a Board of Education, of which the superintendent of public instruction is president. In 1909 the public elementary schools had 2,095 teachers, at an average salary of \$72.50. The school attendance was 87,747.

IDENTIFICATION — ILLINOIS

Charities and Corrections—Idaho has a home for aged soldiers, two asylums for the insane, a penitentiary, an industrial reform school and an industrial training school. Within the State are six hospitals (benevolent) the number of inmates at the beginning of 1910 being 111. The board of county commissioners may contract for the maintenance of the indigent sick and poor. There is no requirement as to residence on the part of applicants for relief, aid being extended even to residents of other States, nor is there any provision for the support of the poor by relations.

Legislation—No regular legislative session was held in Idaho during 1910. In 1909 a law was passed regulating the period of employment in underground mines. Other measures related to the regulation of liquor traffic by county local option and employer's liability. Laws were also passed for the protection of orphans, homeless, neglected or abused children. The issuance of passes or free transportation to certain State and county officers over electric and steam railroads was prohibited.

Identification, New Method of. Many improvements have been made of late years in the systems of identifying criminals—improvements over the older Bertillon system. One of the newest and best systems of the kind—because the surest—is that recently developed by Professor Tamassia, of the University of Padua. It consists in identifying the form of the veins on the back of the hand. A superficial observer would assume this pattern to be essentially the same in all persons, or at least in all members of the same family, and both Lusanna and Capon assert, in their writings, that it is inherited from father to son. Tamassia finds, on the contrary, that the arrangement of the veins in the back of the hand is so characteristic of the individual that it is not the same in any two persons, and therefore constituted the best known means of identification. Even in the same individual, the vein patterns of the right and left hands are quite different. They are almost alike in both hands in some cases, but never alike in two individuals. The two hands would thus help check off each other in the process of identification. In a recent contribution on the subject (*Scientific American Supplement*, 3 Sept. 1910) it is said:

"Tamassia recognizes six classes of vein patterns of the back of the hand. In the first group, one large vein follows a more or less curved or serpentine course, sections of which may be straight, and only a few branch veins are visible. In the second group, the pattern suggests a tree or shrub. Three or four veins diverge from the wrist towards the fingers, where each forms one or more branches. The course of these principal veins is usually undulating and crossed by small secondary veins.

"In the third group, the pattern indicates one large vein and several smaller veins, which form an irregular net, with quadrangular, heart-shaped or oval meshes.

"In the fourth group, two large veins, which may or may not be crossed by secondary veins, form a V with its base at the wrist. In the fifth group, the large veins form an erect and inverted V, the points of which are connected by a short, straight and very prominent vein.

"The sixth group includes patterns in which

the characteristics of the other five groups are combined, often with great complexity."

In the identification of persons by Tamassia's method, it is essential to employ very clear and accurate photographs or drawings. In order to obtain sharp photographs of the vein pattern of the back of the hand, the arm must be left pendent, and slightly bent, during a few minutes. If, in addition, the wrist is bandaged and the veins are marked with a dark pigment, the veins will show very conspicuously in the photograph.

Hence Tamassia's process presents no great difficulties and its simplicity is one of its special advantages. The arrangement and general appearance of the veins of the back of the hand undergo no change with increasing age and they cannot be altered purposely without inflicting serious mutilation.

Ido. Among the international languages evolved in the hope to create one which will eventually be the perfect medium, Ido holds the place of a modified Esperanto (q.v.), having as one of its advantages the absence of supersigns or diacritical marks. This of course makes it possible for Ido literature to be printed in any printing office or on any typewriter, without having special types made. It is claimed for Ido that owing to this one peculiarity it stands a greater chance of being adopted, since English-speaking peoples will not easily adopt a language with numerous accents and diæresis, which they do not have in their own language. Another difference between Ido and Esperanto is that in the former the accusative and the agreement of the adjective are eliminated. The "forty-five particles" condemned as a relic of Volapük, have also been discarded by the makers of Ido.

An organ of Ido is published in London under the title *The International Language* and one in Philadelphia, called *The Internationalist*. The name signifies "a descendant," acknowledging that the new language sprang from Esperanto. One of its advocates, the Marquis de Beaufront, had himself invented a language called "Adjuvanto," which he discarded when he became acquainted with the Esperanto movement.

In 1910, the Ido societies numbered 121, without counting the smaller groups, and its propaganda began in 1908. The societies are distributed as follows: Denmark, Holland, Russia, Canada, and Egypt have one society each; Luxembourg, 2; Belgium, Italy, and Spain, 3 each; Austria, 6; Sweden, 7; England, 9, the United States, 10; Switzerland, 11; France, 26; and Germany, 36. Among its distinguished adherents are: Dr. O. Jespersen of the University of Copenhagen; Dr. W. Ostwald, professor emeritus of the University of Leipzig; Dr. L. Pfandl of the University of Gratz, and Dr. L. Couturat of Paris.

Illinois. A State belonging to the East North Central Division of the United States with an area of 56,650 square miles, of which 650 square miles is water. The population in 1910 was 5,638,591. Springfield, with 38,933 inhabitants, is the capital, but the largest city in the State, and after New York the largest in the United States, is Chicago. In the State the population has increased 817,041 or 16.9 per cent in the past 10 years. In 1910 the

ILLINOIS

population per square mile was 1007, the State ranking third in population.

Agriculture.—Illinois is largely agricultural. In 1900 the farm area comprised 32,794,726 acres, of which 27,099,219 acres were improved land. In 1910 the farm area was 32,471,000 acres. The number of farms reported in 1910 was 250,853, compared with 264,151 in 1900. The total value of farm land and buildings was in 1910 \$3,511,194,000 and of farm land alone \$3,081,564,000. The average value per acre of farm land and buildings in 1910 was \$108.13 and the average value per acre of farm land alone \$94.90. Farms of 19 acres and under numbered 19,613 in 1910; of 20 to 49 acres, 33,243; of 50 to 99 acres 57,850; of 100 to 174 acres 80,444; of 175 to 499 acres 57,661; of 500 to 999 acres 1,840; and of 1,000 acres and over 202. The statistics of the principal crops in 1910 are: Corn, acreage, 10,609,000 acres, production, 474,812,000 bushels; winter wheat, acreage, 2,100,000 acres, production, 31,500,000 bushels; oats, acreage, 4,500,000 acres, production, 171,000,000 bushels; barley, acreage, 30,000 acres, production, 906,000 bushels; potatoes, acreage, 160,000 acres, production, 12,675,000 bushels. The State has an active live stock industry. In 1910 there were 1,655,000 horses (farm animals), 152,000 mules, 1,232,000 milk cows, 1,974,000 other cattle, 817,000 sheep, and 3,772,000 swine in the State. The wool clip in 1908 yielded 4,225,000 pounds of wool, valued at \$887,250.

Mining and Manufactures.—In 1905 Illinois had 14,921 manufacturing establishments with an aggregate capital of \$975,844,799, employing 433,057 persons (salaried and wage earning) using material costing \$840,057,316 and giving an output worth \$1,410,342,129. The chief industries with their capital were: Slaughtering and meat packing, \$80,477,268; iron and steel, \$58,538,650; foundry and machine shop, \$84,497,662; clothing, \$22,392,250; liquors, \$44,458,860; flour and grist, \$14,128,407; and agricultural implements, \$71,383,289. The chief mineral product of Illinois is coal, the productive coal fields having an area of about 42,900 square miles. There are petroleum wells and in 1908 the yield was 33,685,106 barrels, valued at \$22,648,881. The natural gas sold was of the value of \$446,077. Zinc is worked, and in 1908 the output was 298 short tons. Fluorspar to the amount of 31,727 short tons was produced, valued at \$172,838. The output of sandstone and limestone was of the value of \$3,134,770; of Portland cement, 3,211,168 barrels; and of clay products (bricks, tiles, pottery), \$11,559,114. The total mineral output in 1908, including 1,691,944 long tons of pig iron valued at \$30,135,000, was estimated at the value of \$122,900,688. On the Great Lakes there is a large fleet of steamers engaged in carrying iron ore, cereals, and other products between the lake ports. Within the State there are 106 miles of canal and 12,206 miles of railway, besides 2,821 miles of electric railway track.

Fisheries.—The number of persons employed in 1908 in the fishing industry of the State were 4,439; number of vessels 17, valued, including outfit, at \$47,226; number of boats, 4,222 valued at \$234,190; value of apparatus of capture, \$271,859; value of accessory property and cash capital, \$294,075; value of products, \$1,413,242.

Government.—The Governor of Illinois is Charles S. Deneen (term expires 1913), salary \$12,000. The Lieutenant-Governor is John G. Oglesby; Secretary of State, James A. Rose; Treasurer, Edward E. Mitchell; Auditor, J. S. McCullough; Attorney-General, W. H. Stead; Adjutant-General, Frank S. Dickson; Superintendent of Public Instruction, Francis H. Blair. The State Legislature has 51 Senators and 163 Assemblymen.

Finance.—The amount of funds in the State treasury 1 Oct 1908 was \$3,859,263.44; the receipts from all sources from 1 Oct 1908 to 30 Sept. 1910, were \$21,611,919.46, the disbursements from 1 Oct 1908 to 30 Sept 1910 were \$21,046,572.46, the balance of all funds in State treasury 1 Oct 1910, was \$4,424,610.44, of which the revenue fund amounted to \$3,837,629.35. The principal of the bonded debt of the State outstanding 1 Oct 1910 was \$17,500.00. The bonds called in by the Governor's proclamation, which have ceased to draw interest, but have not yet been surrendered are as follows: New international improvement stock, \$4,000; new international improvement stock, payable after 1877, \$500; one old international improvement bond, \$1,000; twelve canal bonds, \$12,000; total, \$17,500.

Religion and Education.—The churches are in the order of strength: Catholic, Methodist, Lutheran, Baptist, Presbyterian. In 1907 the public elementary schools had 25,746 teachers and 928,438 enrolled pupils. The high schools had 2,337 teachers and 55,483 pupils. Six public normal schools had 178 teachers and 4,885 students in 1908, while five private normal schools had 21 teachers and 347 students. Superior instruction is given in many universities and colleges within the State. The University of Illinois at Urbana was founded in 1867, and in 1908 had 485 professors and teachers with 4,376 students. Other institutions are: University of Chicago, 5,617 students, North Western University, Evanston, 3,997 students; Illinois Wesleyan University, Bloomington, 722 students, St. Viator's College, Bourbonnais, 313 students.

Charities and Corrections.—Overseers of the poor provide relief either out-door or in poor houses. Within the State there are 257 benevolent institutions, hospitals, orphanages, homes and schools for the deaf and blind. Of these institutions 20 are public, 117 private, and 120 ecclesiastical. Overseers of the poor in counties not under township organization and in towns with over 4,000 inhabitants are designated by the county board; in counties with township organization the overseers of the towns are overseers of the poor. Paupers must (in whole or part) be supported by relatives according to their ability. For bringing a pauper into a county where he has no legal residence a fine of \$100 may be imposed.

Legislation.—A commission was created in 1910 to investigate the subject of an employers' liability law. The Assembly also passed an act authorizing any city or village, except Chicago, to establish the commission form of government. A petition of 10 per cent of the voters secures the submission of the question to any city. Rejection of the proposition settles the matter for two years. Under the plan the city government is headed by a mayor and four commissioners, elected on a general ticket,

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without party designations, for a term of four years, subsequent to a primary election, at which ten candidates for the five places are selected. Vacancies on the board are filled by the survivors for the unexpired term. Each member of the council heads a department, and the council selects and removes the minor officials not covered by civil service acts. The statute requires the five officials in cities over 20,000 population to devote at least six hours a day to their office. The board meets weekly. All appropriations and grants of street franchises are to remain on file a week before adoption, and the latter must be approved by a vote of the citizens.

History.—The Illinois Pellagra Commission issued a first report to the effect that Indian maize or corn of the variety Illinois grows in no manner responsible for the mysterious disease, known as pellagra. The commission also asked the legislature to appropriate \$15,000 to prosecute its researches during the coming two years. Illinois is the first State in the Union to recognize the disease officially and to make official investigation of its origin. For State Treasurer in 1910 Hartley (Dem.) received 376,046 votes; Mitchell (Rep.), 436,486; Kendall (Pro.), 20,113; Frankel (Soc.), 49,687; Larson (Soc. Lab.), 2,943. Twenty-five representatives were also elected to Congress.

Illinois Central Railway Suit.—An unusual proceeding in American railroading and practically the first attempt made by the stockholders of a large modern railroad to secure action against directors took place at the annual meeting of the Illinois Central Railroad, 19 Oct. 1910 when attorney Maxwell Edgar, holding 60 out of 784,866 shares, constituted himself attorney for the company and served subpoenas upon the directors in a \$10,000,000 suit which he started in the Circuit Court that day. The charge made in the suit was that the directors had wasted that sum of money in car repair graft, general mismanagement, and rebating.

Edgar stated when he appeared in the meeting with two deputy sheriffs that he represented many stockholders, including Secretary McVeagh of the United States Treasury, A. Montgomery Ward, Joseph Coleman, and Henry W. Lemen. The defendants named in the suit were James T. Harahan, President, Cornelius Vanderbilt, R. W. DeForest, R. S. Lovett, John Jacob Astor, J. Ogden Armour, Charles A. Peabody, John G. Shedd, A. H. Hackenstaff, Walter Lutgin, J. W. Auchincloss and Robert W. Goelet. In addition to the plea for \$10,000,000 damages, the suit also demanded an accounting of the road's finances.

Edgar then introduced three resolutions which were lost by an overwhelming majority. They were (1) that the existing management of the road was incompetent, that its officials were violating the interstate commerce law, and that on that account a committee of stockholders be permitted to investigate the railroad's condition; (2) that all members of the Board of Directors not residents of Illinois be compelled to resign from the board on the ground that the constitution of the United States prohibited the proportion of non-residents on the board, (3) that suit be brought against President Harahan and the estate of Ira G. Rawn, formerly vice-

president, on the charge of "gross neglect, criminal laxity and culpable negligence."

At the meeting there were only 75 stockholders present. Edgar also charged that most of the directors were dummies placed there by Charles A. Peabody, a director in the Union Pacific. The charges were made light of, but Blewett Lee, general counsel for the road, said that investigations had been under way for some time with the purpose of decreasing the running expenses of the road and making the saving which Edgar characterized as fraud and mismanagement.

Illuminating Engineer. This is the designation of an expert making a profession of artificial lighting. He has entered a field that was once utilized by the architect and the electrical engineer. To-day illuminating engineering is a recognized profession for which some of our best technical colleges are turning out men. This architect of light does nothing but study light; how fast it travels, its source, the various kinds of light. The illuminating engineer is seeking to discover a secret of the tiny light of the fireflies and the glowworm. The whole point is this: Whereas, the small light of these insects gives very little or no heat, more than 90 per cent of the electrical energy of an incandescent lamp is wasted in useless heat for what little light it gives. If the firefly could tell how to save the waste, some one's fortune would be made. The profession sprang into being owing to the great demand during the past few years for the illumination of thoroughfares, buildings, the great public works. The continued development of the electric light caused a demand for illumination to keep pace with it. An Englishman was the first illuminating engineer. He began to study the means by which illumination might be calculated and thus caused him to urge a more rational use of light. The ideas of A. P. Trotter were quickly taken up on this side of the water. As a consequence, the illuminating engineer began to develop with greater rapidity here until at the present day, it has become a distinctly American profession. The whole thing is practical, for the illuminating engineer not merely calculates light and studies it from a scientific standpoint, but it is distinctly his duty to devise light that will give the best result at the lowest cost. It has already been found that light travels at the rate of 186,000 miles a second. Delicate machinery of a most intricate nature has made this calculation. The source of light of the glowworm and firefly we are trying to learn. That of the sun is a great mass of white-hot matter. The source in an arc lamp is the heated particles of carbon floating between the white-hot tips of the electrodes that electricity raises to a high temperature. The source of light itself is a substance raised to such a temperature as to set up waves in the surrounding ether which produce when falling what we know as light. These are some of the things the illuminating engineer tells us. Another is that the light in gas and oil lamps is thrown off by the myriad particles of carbon heated to incandescence in the flame. The white-hot mantle produces the light of the new gas lamps. Five-candle power per square inch of surface is as much light as the human eye can withstand without fatigue. The power of the arc

ILLUMINATING ENGINEERING—ILO

light is 10,000 per square inch. It ranks next to actual sunlight. The new metal filament lamps give about 1,000. The method by which the various colors of light are separated is interesting. A refraction prism is used. The white light contains all the colors of the rainbow, harmoniously blended together. The purest white light is that of the sun. The sky light is bluish white. That of the arc and metal filament electric lamps nearly pure white while the light of the mantle burner is greenish white. A law of the incandescent light is that the higher the temperature, the better the light and the greater the economy of current consumed. An important change effected by the illuminating engineer was in doing away with the chandelier in the placing of the lights. The dimensions of the room and the colors of the wall, ceiling, floors, and furniture are things considered. The amount of light required for each apartment and the "wattage" necessary to secure it are carefully considered by the illuminating engineer. The "wattage" once known, the number of lamps required, the candle power, and the places on the ceiling are all determined. The old style shades and reflectors have disappeared. The new ones concentrate the light to the best advantage. Perhaps the best known work of the illuminating engineer was the illumination of Niagara Falls in 1907. For that occasion, there was used a battery of about 50 large searchlights, some capable of throwing a beam of white light 125 miles. They were located below the falls at the water's edge opposite Goat Island and also on the cliff. The illuminating engineer was also a big factor in the Hudson-Fulton Celebration in New York in 1909. The tower of the Singer Building and also that of the Metropolitan Life with its huge clock capable of being seen for miles around at night are examples of his genius. The finest, though, is the new Union Station at Washington. It is lighted indirectly by electricity and the artificial illumination diffuses the light in exactly the same proportion as actual daylight. Another example of the illuminating engineer is upper Broadway and 5th avenue, New York, both of which thoroughfares were once comparatively dark. The illuminating engineer has his tools just the same as any one else. He devises them all himself. The latest instrument is the luximeter. It is a portable device to measure the illumination on any surface. Another is the luminometer, sometimes called type-reading photometer, by which the lighting distance or illuminating value of street lamps are measured. By means of the spectroscope and spectrophotometer, a beam of light and the measure of colors may be analyzed. The spectrometer, another instrument, makes it possible to tell from a ray of light whether a star is moving towards the earth or away from it and how fast. There are different kinds of photometers for measuring the candle power of different sources of light. The term, "foot candle" as used by the illuminating engineer, means the intensity of illumination a single candle gives on a screen one foot from the flame.

Illuminating Engineering. This field of engineering has broadened considerably during the past year. It is no longer restricted to lamps, candle power and foot candles, but also deals with architecture, decoration, optics, color effects,

physiology, and the commercial side of lighting. It figured in the course at Johns Hopkins University, Baltimore, in 1910. There were 36 lectures delivered by men chosen by the Illuminating Engineering Society, which held its annual convention in Baltimore last year. A most important discovery during 1910 was that of Peter Cooper Hewitt. It was a light transforming reflector and had to do with adding the missing red rays to the light from the mercury-vapor lamp. The latter has never been able to be used where color representation was important because of the absence of them. Now that it is possible to add the red rays, the mercury-vapor lamp will have a wider field of use. See ILLUMINATING ENGINEER

Illumination. The following remarkably complete table of the cost of various methods of illumination was compiled by the *Frankfurter Zeitung* during 1910:

	Cost of 100 normal candle hour cents
Washington light	0 238
Flaming electric arc	0 381
Mercury vapor lamp	0 595
Incandescent gas light	0 595
Incandescent petroleum light	0 714
Direct current electric arc	0 942
Osram, zircon, and tungsten lamp	1 190
Kerosene burner	1 666
Osmium lamp	1 785
Tantalum lamp	1 904
Incandescent alcohol lamp	1 904
Alternating electric current arc	1 904
Nernst lamp	2 023
Small arc lamps	2 142
Acetylene	2 856
Carbon filament	3 808
Argand gas burner	3 808
Fish tail gas burner	3 950
Steam candle	16 180

The Washington lamp is an incandescent lamp which burns petroleum under pressure. In compiling this table the following average prices for fuels and electric energy have been employed:

	Cents per pounds
Kerosene	2 38
Alcohol	4 33
Steam candles	16 23

Gas	107 87	Cents per thousand cubic feet
Acetylene	809 07	Cents per thousand cubic feet
Electric energy	11 90	Cents per kilowatt hour

Ilo. The production of a new scientific international language under the name of Ilo, had its beginning at the International Exposition in Paris in 1900. Here a league of linguistic scholars was formed, and after some years of work the new language resulted. Its international character is shown by the fact that when Couturat counted the roots employed in the first dictionary of the new language he found the following numbers, out of the total of 5,379 among the words of present day languages.

French, 4,880, that is, 91 per cent
Italian, 4,454, that is, 83 per cent.
Spanish, 4,237, that is, 79 per cent.
English, 4,319, that is, 79 per cent.
German, 3,302 that is, 61 per cent.
Russian, 2,821, that is, 52 per cent

The grammar is characterized by perfect regularity. Its rules may easily be printed on one page, and there are no exceptions. The conjugation of one verb is on the same prin-

IMMIGRANTS—IMMIGRATION

ciple as that of every other. The name is a contraction of "Internacionalingo."

The way in which Ilo shortens writing is made clear by a brief extract from an English translation of a German original, compared with the translation of the passage into Ilo.

Scarcely once in thousands of years will such a combination on a grand scale occur.

Apene un foyo en yarmih revenas tala unono en granda mezuro.

The scientific man, jealous of every half-hour which must be spent in taking notes or in having translations made, when new and fascinating phenomena await his study, will, it is believed, profit enormously by the devising of a language which is a universal time-saver. It will be seen that while brevity, clarity, and true international character have been the aims of the inventors of Ilo, it by no means lacks a musical flow of sound and a picturesque vigor of its own. Many of the compound words would be recognized at sight for what they are, without recourse to a dictionary, whether the reader were English, Spanish, French, or German. Such words are "glacyofabrikeio" (ice-factory), "max rara" (most rare), "vapor-kaldrono" (steam boiler). And this also is a consideration in learning a new language.

Immigrants, North American Civic League for. A new organization formed in New York, to protect immigrants from impositions and petty frauds and to assist them in other ways. A similar organization bearing the same name, was founded in Boston in 1908 by D. Chauncey Brewer. While the New York body is in a way an outgrowth of the older society, it has been organized mainly to carry into effect the many suggestions made by Governor Hughes' Immigration Commission, including the bringing out of remedial legislation in the interest of immigrant aliens. It will also constitute a permanent organization to assist the Bureau of Immigration, if one is authorized by the State Legislature and it will at the same time carry on work on behalf of immigrants which a State department could not undertake. The chairman of the new organization is John Hays Hammond; Frank Trumbull, vice-president of the Chesapeake and Ohio Railroad, is vice-chairman; Frank A. Vanderlip of the National City Bank, is treasurer, and Miss Frances A. Kellor, member of Governor Hughes' Immigration Commission, is secretary. Other members of the committee are Jacob A. Riis, Felix M. Warburg, Thomas M. Mulry, and John B. Carse.

It is intended that there will be no duplication of any of the work now being done for immigrants by existing organizations. A great deal of the work will be new. Besides taking new measures for the protection of immigrant aliens in New York State, the committee seeks to coordinate all the present activities of existing organizations and to act as a sort of clearinghouse for the advice, assistance, protection, and education of immigrants and their children. The committee will also attempt in time to put into effect a plan for the wider distribution of aliens so as to relieve congestion in Manhattan. It is intended with the help of the railroads to establish immigrant agencies, which will keep the committee informed of opportunities for labor. A system is being devised to enable the

officers to keep track of immigrants who leave town for inland destinations, particularly of unmarried immigrant girls. Another object is to encourage immigrants to do their banking in this country and to invest their money in American securities instead of sending it abroad. The new league has also a registry bureau which will send to Boards of Education in cities and districts in New York State a notice of the children who are coming to live in their districts and in that way to safeguard the education of these future citizens.

Immigration. Some years ago the prophecy was made that the total number of immigrants in the United States in one year would reach a round million. This statement was received with incredulity, but this figure for the last official year has actually been passed, for during that period no fewer than 1,041,570 immigrants entered the United States. Nor is that the highest figure that has been yet reached. The past 10 years have marked an increase in immigration such as the shrewdest forecasts of the expert could not have foreseen at the beginning of the decade. Saving a phenomenal flood of human imports that in 1882 raised the sum past the three-quarter-million mark, the halfmillion figure was not reached half a dozen times in any year from the beginning of the Republic to the year 1902, when the sum total of immigration for the 12 months shot up to 648,743. In 1905 it reached the million-a-year mark, hung there for two years more, dropped back under the influence of the panic of 1907, around the three-quarter-million mark in the two succeeding years, and rose again in the fiscal year ended June 1910 to above a million. The following are the totals of immigration into the United States for the past decade: 1901, 487,918; 1902, 648,743; 1903, 857,046; 1904, 812,870; 1905, 1,026,400; 1906, 1,100,735; 1907, 1,285,349; 1908, 782,870; 1909, 751,786; and 1910, 1,041,570. This makes a total for the decade ending the fiscal year of 1910 about 8,705,000. The grand total of immigration from 1820 to the present time is nearly 28,000,000; this in 90 years. Yet the past decade has furnished about 30 per cent of the grand total. "The remarkable expansion in all branches of industry and the resulting need of additional labor forces wherewith to prosecute them," says the special Industrial Investigation Committee of Congress, "has resulted in a general, simultaneous, and constantly increasing demand. In the face of this extraordinary demand, the labor resources of the country, consisting of the native stock and the races of older immigration from Great Britain and Northern Europe, were found wholly inadequate and recourse was had of necessity to the races of recent immigration from Southern and Eastern Europe." As a consequence the racial composition of the industrial population of the country has quickly undergone a complete change, and the cities and industrial localities, as well as the farming communities, of the United States have received enormous additions to their population in the form of industrial workers far more alien in speech, manners, and customs than ever were the immigrants from the British Isles and North Europe. The foreign communities of recent immigration which have sprung into existence by reason of the industrial expansion are of two

IMMIGRATION

general types. The first is a community which, by a gradual process of accretion, has affixed itself to the original population of a city or industrial centre already well-established before the arrival of the races of recent immigration. Foreign communities of this type are as numerous as the older cities and industrial centres of country, anyone of which in New England, the Middle States, the Middle West, or Southwest, has its section or colony of recent immigrants from the south or east of Europe. The dividing line between these immigrant sections and the original community to which they are affixed, is much more sharply drawn than where the like sections of the older immigrants, who, being nearer to the American blood and more akin in manners and customs, readily mixed and blended with the original inhabitants. The second type of the communities of the recent immigrants has sprung into existence of recent years by reason of the development of some natural resources such as coal, iron or copper, or by reason of some extension of great industrial enterprise, as the erection of mills or buildings or smelters and furnaces. The communities are usually clustered around mines or industrial plants wherein their inhabitants are employed and their distinguishing feature is that the large majority, often practically all the population, is of foreign birth, and racially composed of Slavs, Magyars (Hungarians), Italians, and other people of recent immigration. Illustrations of this type are common in the bituminous and anthracite regions of Pennsylvania and the coal-producing areas of Virginia, Ohio, Illinois, West Virginia, and Oklahoma.

The amount of money brought over by the immigrants is somewhat difficult to determine, since funds are often brought over for the use of resident immigrants. The total amount brought over by the immigrants for the year ended June 1909 was \$17,331,828, or about \$23 a head for the 751,786 immigrants arriving that year. The North, the Middle West, and the Pacific Coast have got the bulk of immigration from the last 10 years. The proportion that drifted to the South is hardly worthy of mention, although the large majority of these immigrants came from warm climates. It is clear that the new immigrant shuns the country, as contrasted with the life of the city, or rather his own little colony in the city or hard by the factory where he works. Statistics from all the institutions of detention in the United States show that of the Teutons detained therein 17 per cent are in penal institutions. Of the Celtic 15 per cent are thus held; of the Slavs detained 25 per cent are held for crimes, and of the Iberic (which embraces all Southern Europe), 39 per cent are detained for crimes. Thus it will be seen that the Iberic or South Europe division leads in crime, with the Slav of East Europe second, the Teutonic or Germans-Scandinavian third, and the Celtic—embracing most of the English speaking peoples of Europe—are the least criminal. On the other hand it has to be remembered that under the term "crimes" are included many trivial offenses due to conditions created by poverty.

There has been a general feeling of late in and out of Congress that some check should be put on the growing immigrant flood and the Immigration Commission, which deliberated for

three years in its last report urges that steps be taken in this direction. Sentimental considerations in restricting immigration should be waived says the report in view of the economic problems arising from adverse effects on wages and living conditions while the large number of aliens have had in recent years by their entry into basic industries. The report further says: "The present immigration movement is in large measure due to economic causes, but emigration from Europe is not now an absolute economic necessity, and as a rule those who emigrate to the United States are impelled by a desire for better conditions rather than by the necessity of escaping from intolerable ones. This fact should largely modify the natural incentive to treat that immigration movement from the standpoint of sentiment and permit its consideration primarily as an economic problem." The commission presented several proposals by which restriction of immigration might be affected, including a reading and writing test, the exclusion of unmarried unskilled laborers, limitations in the number arriving at any one port and from particular races, as well as in the amounts of money in their possession on arrival. All members of the commission did not concur in the feasibility of the reading and writing test.

The National Liberal Immigration League has publicly expressed itself against that part of the final report of the Immigration Commission favoring the restriction of unskilled labor. The reasons given for the protest are that this restriction was not agreed to unanimously by the commission, and that unskilled labor does the first and hardest manual work in opening up new railroads and in reclaiming new tracts of land and in the first actual work of any new canal or public enterprise of the kind. It was found in 1907 that the unskilled immigrants who passed the tests and were then not needed migrated to places where they were needed and were able to form new communities. The protest has the backing of a large number of prominent citizens.

According to W. E. Carson, an American writer and traveler, who investigated emigration conditions in Europe, the majority of well-to-do emigrants do not come to the United States. The reason is, he thinks, because the United States has no commercial agencies in the United Kingdom, Germany, Holland, Sweden, Norway, or Denmark, to inform the immigrants of the advantages of this country. Canada, Australia, and South Africa flood Europe with literature, pictures and specimens of the agricultural and mineral products of the territories they represent. The governments of these countries open agencies in the principal cities, employ capable press agents, and enter into keen competition with one another. Texas, South Carolina, Florida, Minnesota, or any State that is in want of immigrants with a little capital could get them, he thinks, by opening commercial agencies in Northern Europe and showing the people over there that they would be looked after when they arrived in this country. "Canada has as many fakirs as the United States," Mr Carson said, "but the European newspapers do not publish accounts of their swindling operations because they never hear of them. When any big firm in this country goes to pieces the European newspapers print

IMMIGRATION

from half a column to a column with the heading, 'Another Yankee Swindle,' 'Public Robbed of Millions,' so that there is a general impression over there that the immigrant would not be safe in coming here with money." "The immigration laws are stricter in Canada, which is our biggest competitor in the immigration business, than they are in the United States. They will not allow shiftless people to enter; even if they are British subjects, and there has been considerable discussion on the question in the British Parliament, but Canada stands firm in her attitude. It is time, if we want to get the good class of immigrants to come to the United States, that there was some effort made to tell them that they will be made welcome if they come and protected when they get here."

A society to be known as the National American Federation for the Promotion of Sane and Liberal Immigration Laws was organized in December at a meeting of professional and business men interested in the subject. The object of the society, as set forth, will be to oppose adoption of further restrictive immigration laws, unless based on physical or moral disability; to aid in distribution and placing of immigrants to this country; to educate the foreign-born seeking naturalization in the principles of citizenship, and to oppose any social or racial discrimination.

The European countries began first to feel seriously the loss through immigration to the United States towards the close of the first decade in the 20th century. Norway and Sweden realized this in particular, on account of the large number of young men and women who had come to America. In 1900 when the census was taken it was shown that Norway had contributed 338,426 persons out of the immigration amounting to 10,500,000. Sweden had contributed 574,625 and Denmark 154,616. In the past 10 years, this proportion has fallen, but Norway contributed 160,000 from 1900 to 1910. It was shown that if the drain of young men continued Norway would soon reach a period of stagnation and a vital problem would be presented. The European nations as a whole have not taken up the question officially, but there is an increasing interest in devising means of rearranging the industrial conditions at home so that the emigrants will not feel the necessity of leaving in order to win economic freedom. The migration has not been entirely towards America, as there was a strong back-current following the financial depression beginning with the close of 1907. In the year ending July 1908, 700,000 aliens returned to Europe, more than half of them taking their families back to stay. The following year about 400,000 returned, but in 1909 and 1910 the tide set strongly in this direction once more.

Immigration, 1910 The total immigration into the United States in 1910 was 1,198,037, according to the authoritative figures furnished by the Secretary of Commerce and Labor. In making the report he predicted that the immigration would increase during 1911 close to the biggest year, 1907, when 1,250,000 arrived. The arrivals during 1910 brought with them \$28,197,745, an average of about \$27 per capita. Assistance was lent to 274,000 by other immigrants who had preceded them, so that a large share of the money brought in originated in America and

was a debt to be paid back in many instances to the person who advanced it.

Most of the immigration was from southern and eastern Europe, comprising chiefly Italians, Greeks, Jews, and Slavs. Of the last-named, many are not entirely Slavic, as the word Slav has been stretched to cover all the many nationalities in southeastern Europe.

Of those who applied for admission only 2 per cent were turned back, numbering in all 24,270, which was an increase over 10,411, the number turned back in 1909.

The movement of immigrants into the United States during the three years, 1908, 1909 and 1910 is shown in the following table:

	1908	1909	1910
January	27,220	43,868	50,242
February.....	23,381	67,154	57,980
March	32,517	113,038	130,745
April.....	41,374	116,754	135,052
May	30,317	107,939	133,544
June	31,947	85,470	105,025
July.....	27,570	60,218	73,153
August	27,782	59,777	78,574
September ..	38,238	67,619	81,931
October	40,994	75,608	83,705
November ..	37,076	85,049	74,353
December..	46,003	68,711	70,000

During May, 14,347 immigrants arrived from Russia. Of these 13,000 were Poles, one-third of whom could neither read nor write, and had in other respects been so hampered in the matter of education that many of them did not know the number of days in the week or the months in the year. In the same month, Italy sent 33,684. Of these 30,439 were from Southern Italy, from which most of the Italian immigrants have come. Half of them could neither read nor write.

Considerable agitation was aroused during the year on account of the increasing illiteracy of the immigrants, but the answer was made that many of the immigrants who helped make the United States as powerful as it is were no less ignorant. The fact that the immigrants had sufficient enterprise to break away from their homes and come to this country has in itself been advanced as a strong argument in favor of admitting them, regardless of their number or lack of knowledge. It was shown, however, that a great many immigrants do not come altogether of their own initiative, but are aroused by steamship agents who travel throughout the rural districts of Europe selling tickets over their lines and bringing parties of immigrants to the seaboard where they are safely conveyed aboard ship. Once arrived in this country, this class of immigrant is likely to fall prey to conditions which they had not expected. Secretary Nagel said in his report that immigrants are constantly being signed up on ships' crews, although paying their passage, and admitted into this country when there is lawful reason for their exclusion.

Three-fifths of the immigrants have so little money that they cannot travel far inland and are forced to seek whatever employment presents itself first. These find employment in New York, New Jersey, Connecticut, and Massachusetts, and remain there. Most of the others do not go as far west as Chicago, and the western portion of the country which is in need particularly of agriculturists is not adequately supplied. A large portion of the immigrants came from agricultural and stock-raising districts, but, finding work in the mills, mines,

INCOME TAX

and foundries, prefer the higher wages to agricultural work. Several attempts have been made to change the course of immigration and an increasing number of immigrants are brought in through Texas and the ports of the South, and with the opening of the Panama Canal there will be a new flood into the Pacific Coast.

Secretary Nagel in his annual report to President Taft, submitted in Dec 1910, recommended that more drastic action be taken by State and Federal officials regarding the white slave traffic (q.v.), which he said the immigration officials were unable to cope with under present conditions. Cooperation, he believed, would result in the suppression of the traffic, which he admitted was large.

One of the hardships he pointed out was that of denying admission to families after the father had come to this country and established a home. Families in such cases frequently arrive and cannot pass the health inspection. This condition is known in advance in many cases by the steamship agents, he asserts, and recommends that some method be found to learn the condition of a man's family in advance of sailing.

The immigration stations are inadequate for the business they do. This condition is particularly true of Ellis Island, and it is recommended that unless the immigration can be diverted that some means be taken to improve conditions.

A stricter regulation over steamship companies, Secretary Nagel reported, is a necessity. He urged a system of fines to be laid against the companies bringing insane immigrants or those afflicted with contagious diseases. General regulation of steamships as to their sanitary and seaworthy condition is recommended. Contract labor is apparently under check, and only 1,700 were deported who were entered in this manner.

Income Tax. Amendment proposed to the constitution, which, if adopted, will be the 16th, empowering congress to impose a tax on incomes, operating within the States and without regard to population. It is said that if the amendment is adopted, the new tax will provide for such exemptions on small incomes and such graduated rates on large ones as to bring little revenue from the poorer sections and the bulk of it from the more wealthy. The vote on the amendment was unanimous in the Senate. There were only 14 votes in opposition in the House. President Taft suggested the submission of the amendment, though his consent under the constitution is unnecessary. It will be necessary for three-fourths of the States to ratify it. Up to this writing, the legislatures of Illinois, Georgia, Alabama, Maryland, South Carolina, Oklahoma, and Mississippi, seven in all, have ratified the amendment. New York, Pennsylvania, New Hampshire, Rhode Island, Connecticut, New Jersey, Vermont, Maine, Colorado, and West Virginia seemed committed against it last year. The rejection of this amendment by 12 States will prevent its adoption. The platforms of both Democratic and Republican parties in Ohio, Maine, Iowa, New Hampshire, Indiana, Wisconsin, Montana, Kansas, Idaho, Nevada, North Dakota and Colorado favor the passage of the amendment without qualification. The Republican platforms of California and Utah are also

favorable. The Democrats of Connecticut, Minnesota, Pennsylvania, Massachusetts, Nebraska, Rhode Island, Vermont, and Tennessee have also declared for an income tax. During 1911, the legislatures of 42 States will convene, and if 35 ratify the amendment, it will be adopted. Those who favor the tax propose to carry on an active campaign in New York and others of the States that were hostile last year. Much comment was aroused by the opposition of Governor Hughes in 1910. In a special message to the legislature, he stated that while he was in favor of conferring upon the Federal government the power to lay and collect an income tax, without apportionment among the States according to population, the power should not be granted in such terms as to subject to Federal taxation the income derived from bonds issued by the State itself or by municipal governments organized under the authority of the State. Governor Hughes urged that the placing the borrowing capacity of the State and the cities at the mercy of the Federal taxing powers would be an impairment of the essential rights of the State, which, as an officer, he was bound to defend. In reply to Governor Hughes, it is pointed out that the tax will be framed by members of Congress from the States and that they will certainly see that the law as framed, does not tax State or local securities. There have been three periods of income-tax activity in the United States. The first was from 1840 to 1850. The second during the war from 1860 to 1870. Under the income tax of 1862, which was in force until 1873, the government collected \$374,000,000. The third period was from 1895. It began after Congress passed the Wilson-Gorman Tariff Act. The income-tax feature was declared unconstitutional after a rehearing before the United States Supreme Court by a vote of 5 to 4. The leading argument against the tax was made by Joseph H. Choate and William D. Guthrie, of New York, while the late James C. Carter and Richard Olney, then Attorney-General, defended the measure. The grounds for the decision of the Court are of import. Article I of the constitution declares that direct taxes must be apportioned according to population. The act made no such apportionment. The court defined a tax on incomes from real and personal property to be a direct tax. It, therefore, declared the measure unconstitutional. A number of the States have tried the income tax. Prior to the present period of activity, 13 abandoned it, and South Carolina was the only one to frame a new measure. There were four States that employed the tax at the beginning of the period. Massachusetts was one and Virginia, North Carolina, and Louisiana the other three. Massachusetts has had a law since 1873, taxing incomes of more than \$2,000 except when derived from property or estates already subject to taxation. Very little revenue has been raised under the act. A reason for this is the lack of proper statutes to enforce it. In Virginia, all forms of income such as rent, wages, interest, and profits are taxed. There are some specific reductions and a general exemption ranging from \$600 to \$1,000 allowed. Under the act of Jan. 1908, taxation is provided for "the aggregate amount of income in excess of \$1,000, whether received or due, but not re-

ceived within the year next preceding the first of February in each year." The law states the sources of rent, interest, salaries, and profits subject to the tax. Incomes under \$1,000 are exempt, also losses sustained during the year. North Carolina has levied an income-tax since 1849. During part of the time, it applied to wages, interest, profits, and rent. In 1893, a new law was passed. There were more specific provisions and a progressive rate. In 1901, the progressive rate was abolished and a proportional rate substituted of 10 per cent on all incomes in excess of \$1,000 except such as derived from property already taxed. Written questions were presented to taxpayers to list in itemized form. The gross income from all sources, except property, was taxed. A later act was passed in 1905, which required the taxpayer simply to declare under oath the amount of his gross income in excess of \$1,000 from "salaries, fees, trade, profession, and property not taxed." It was made unlawful and subject to a fine of \$50 and imprisonment to publish the income-tax list or any part. Louisiana first levied an income tax in 1805. While it continued until 1900, the act was never enforced. In 1899, only two of the 59 counties reported the incomes. The total receipts amounted to \$104. South Carolina had an income-tax continuously from 1701 to 1868. The revenue it raised, however, was very slight. In 1868, the law was repealed, but in 1895, when a new constitution was adopted, it empowered the legislature to levy a graduated tax on incomes. In 1896, a bill for that purpose was introduced, but defeated after a long debate. The following year, an income-tax was passed. It went into effect in March 1898. The exemptions were fixed at \$2,500. There was no tax on interest derived from Federal or State bonds. The law also provided that in computing incomes, necessary expenses actually incurred in carrying on the business, occupation, or profession should be deducted. Oklahoma enacted an income-tax in May 1908. Under it the following question is put: "Was your gross income from salaries, fees, trade, profession, and property upon which a gross receipt or excise tax has not been paid, and all of them, for the year ending 30 June last preceding in excess of \$3,500?" The rate is 5 mills on amounts in excess of \$3,500 or less than \$5,000; 7½ mills between \$5,000 and \$10,000; 12 mills between \$10,000 and \$20,000; 15 mills between \$20,000 and \$50,000; 20 mills between \$50,000 and \$100,000, and 3½ per cent on all sums in excess. In 1899, Michigan levied a tax upon incomes exceeding \$1,000.

India, British. See BRITISH INDIA.

Indian Affairs. See INDIANS.

Indiana. A north central State of the United States, with an area of 36,350 square miles, of which 440 square miles is water. The population in 1910 was 2,700,876. Indianapolis is the capital city, with 233,650 inhabitants. The population of the State was 2,516,462 in 1900, and 2,192,404 in 1890. The increase in the last 10 years has therefore been 184,414 or 7.3 per cent. The population per square mile was 75.3 in 1910, 70.1 in 1900, and 61.1 in 1890. Indiana ranked 9th in population in 1910 and 8th in 1900.

Agriculture.—Indiana is largely agricul-

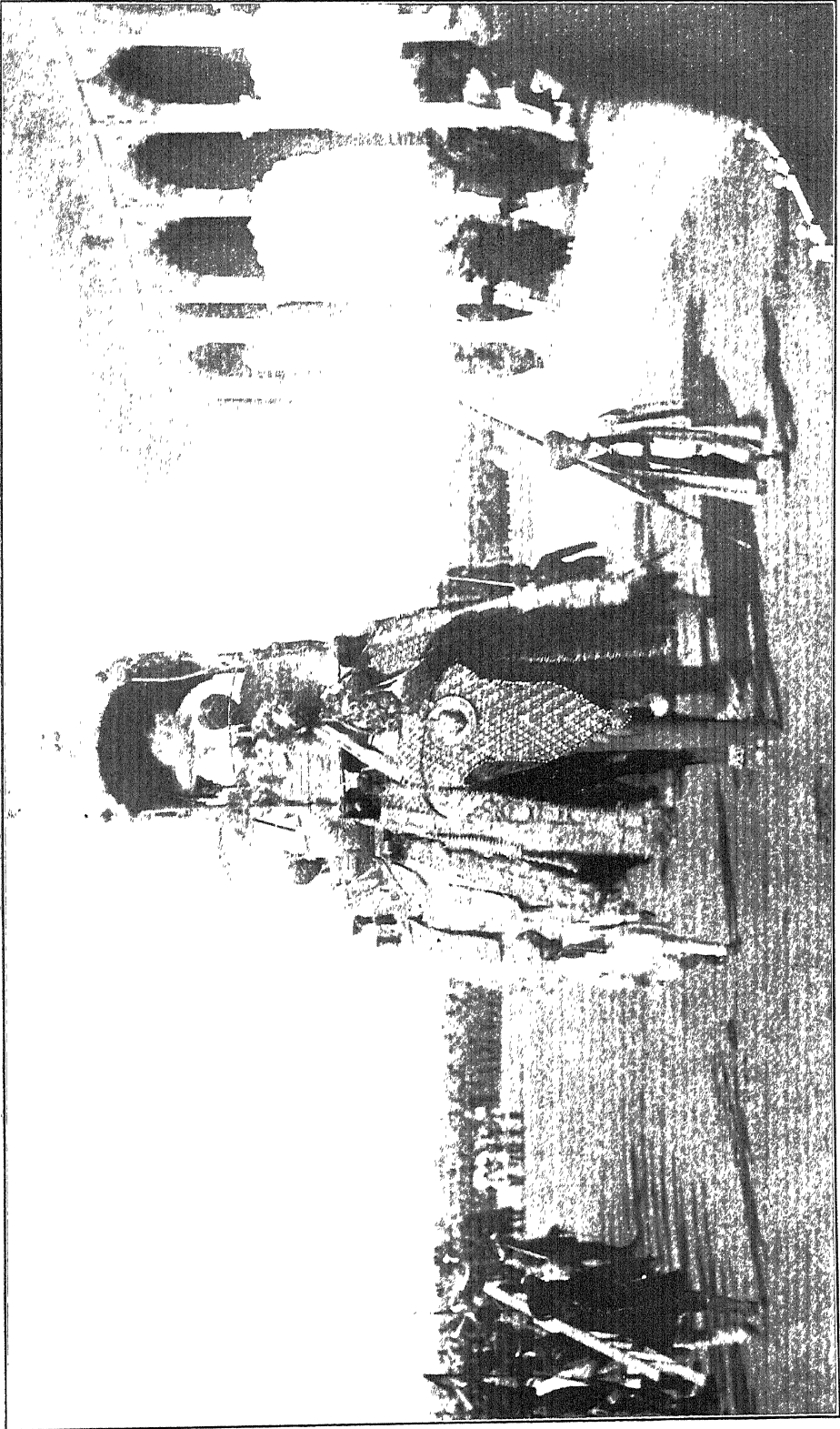
tural, about 94 per cent of its total area being in farms. The number of farms in the State in 1910 was 214,741, compared with 221,897 in 1900. The total value of farm land and buildings was \$1,590,225,000, while the total value of farm land alone was \$1,325,475,000. Value of farm implements and machinery was \$40,880,000. Total acreage was 21,264,000 acres; improved acreage was 16,903,000 acres. Area of average acres per farm was 99, average value per acre of farm land and buildings \$75, average value per acre of farm land alone \$62. Farms operated wholly or partly by owners were 148,001, by tenants 64,451, by managers 2,289. Of the whole number of farms in 1910, those of 19 acres and under formed 11 per cent; 20 to 49 acres, 19 per cent, 50 to 99 acres, 31 per cent, 100 to 174 acres, 26 per cent, 175 to 499 acres, 12 per cent, 500 to 999, 0.4 per cent; and those of 1,000 acres and over, 0.07 per cent. The expenditures for labor in 1910 reached the sum of \$17,903,000. Statistics of the principal crops in 1910 were: Corn: acreage, 5,120,000 acres, production, 201,216,000 bushels; winter wheat, acreage, 2,627,000 acres, production, 40,987,000 bushels, oats: acreage, 1,850,000 acres, production, 65,490,000 bushels, barley, acreage, 9,000 acres, production, 243,000 bushels; rye: acreage, 55,000 acres, production, 869,000 bushels, potatoes: acreage, 92,000 acres, production, 7,728,000 bushels.

Live Stock and Animal Products.—Indiana is an important centre of live-stock traffic. There were 847,000 horses in the State of a value of \$103,334,000, and 94,000 mules valued at \$11,844,000. The number of milch cows was 687,000, valued at \$28,107,000; other cattle, 1,020,000, value, \$24,990,000; sheep, 1,227,000, value, \$6,380,000, pigs, 2,578,000, value, \$25,780,000. The value of wool scoured was \$3,038,750.

Mining and Manufactures.—The total area surveyed up to 1 July 1910, was 2,941 acres. The area devoted to petroleum was 1,000 square miles, the gas area being 2,400 square miles. The coal fields of the State have an area of 6,500 square miles, where 18,380 miners are employed. In 1909 the production of coal in the State amounted to 11,692,72 tons, valued at \$12,276,676. In 1908 the output was 12,314,890 tons, valued at \$13,084,207. In the same year the output of crude petroleum was 3,283,629 barrels, valued at \$3,203,883, while the value of the natural gas sold was \$1,312,507. The output of sandstone and limestone was valued at \$3,646,603. The production of Portland cement was 6,478,165 barrels, valued at \$5,386,563; of natural rock cement, 212,901 barrels, valued at \$42,580. The clayworking industries are important, yielding pottery, tiles, pipes, bricks, etc., to the value of \$6,740,167. Mineral springs in the State yielded water to the value of \$590,879. The total mineral output was valued at \$37,295,494. The manufacturing industries in the State are extensive and various, employing, 1905, 176,227 persons (including proprietors, clerks, and wage earners), using materials worth \$220,507,007, and turning out products valued at \$393,954,405. The broom industry is growing in Indiana, the centre of manufacture being at Evansville, which sends brooms to all parts of the world.

Government.—The Governor is Thomas R. Marshall (Democrat), with a salary of \$8,000.

INDIA



THE STATE ELEPHANT IN INDIA

INDIANA—INDIANS

his term of office expiring in 1913. The Lieutenant-Governor is Frank J. Hall; Secretary of State, L. G. Ellingham (elected 1910); Treasurer, William H. Vollmer, Auditor, Wm. H. O'Brien, Attorney-General, Thomas M. Honan; Adjutant-General, Geo. W. McCoy, Superintendent of Education, Chas. A. Greathouse. Members of the United States Legislature from Indiana, elected in 1910, are: Messrs. Bohne, Cullop, Cox, Dixon, Morse, Barnard, Korbly, Adair, Morrison, Crumpacker, Rauch, Cline, and Barnhart.

Finance.—For the year 1910, the receipts and expenditures were as follows: Total gross receipts: \$11,036,013, total gross disbursements, \$11,287,184. The foreign debt in 1910 amounted to \$805,615; the domestic debt—to \$704,548; total, \$1,510,163.

Religion and Education.—The religious denomination most numerous represented are Methodist, Catholic, Disciples of Christ, Baptist, Presbyterian, United Brethren, Lutheran, and Friends. Within the State, in 1907, were 6,489 church organizations with memberships of 1,003,045. Sunday schools had 514,164 members. There were 4,169 active ministers, and 6,239 houses for worship. In 1909 the public elementary schools had 16,895 teachers, 530,341 enrolled pupils. The public high schools numbered 804, and had 2,056 teachers with 47,592 pupils. At the same time, in private and parochial schools giving primary or secondary instruction, were 17,417 pupils. Teachers are trained in two public and six private normal schools, the former having, in 1908, 9 teachers and 2,864 students. Indiana has many institutions for superior education, the more important being Indiana University, 83 professors, 2,051 students, De Pauw University, 41 professors, 985 students, and Notre Dame University, 60 professors, 875 students.

Charities and Corrections.—All the public charities and many of those of a private nature are under the supervision of the Board of State Charities. The state maintains four hospitals for the insane and is erecting a fifth. It has also State Homes for Soldiers and for Soldiers' and Sailors' Orphans, schools for the deaf, blind, and feeble-minded respectively, and a village for epileptics. In every county there is an asylum for the poor. There are in Indiana 15 State charitable, penal, and correctional institutions; 40 orphanages receiving public wards, and 16 receiving only private wards; 23 homes for the aged; 47 general hospitals; 92 county poor asylums; and 91 county jails.

Legislation.—There was no regular session of the legislature during 1910. In 1908 a bill was introduced to repeal the county option law in regard to saloons, but it was defeated by a very narrow majority. Since then the Supreme Court of the State has declared the county option law to be constitutional. Among the measures enacted by the Legislature of 1909 are those noted below: a measure was enacted establishing a maximum passenger rate of 2 cents a mile on railroads. Laws relating to tenement houses were amended and amendments were made to the laws governing elections. Provisions were made for public playgrounds in the cities, and the statute relating to sanitation and methods in the shops of food producers was amended.

History.—Much interest was taken through-

out the State, particularly in Indianapolis, in the commission form of government for cities. By this commission form a council governs the city, each member being placed in charge of a department of the city administration. One member of the council is known as the mayor of the city, but he has no more to do with conducting the city's business than any other member of the council. Gambling houses and kindred resorts were recently ordered out of Gary as menaces to the public safety and public morals.

Indians. A report by the superintendent of the Carlisle Indian School shows that of the 2,189 who attended the school even for a brief period, 94 per cent have given up their tribal traditions and are now earning livelihoods in the ordinary walks of civilized life. The report also accounts for 514 living graduates of the school, and these, for the most part, have made long strides in the direction of progress. Of this number 93 are in the government service as clerks, instructors, interpreters, laborers, and night watchmen. Others are employed as supervisors of Indian employment. Many have invaded the professions, trades, and business. Four are in the army, and some in the navy. Of the women graduates, 142 are classified as housekeepers.

The Bureau of Indian Education has been making a determined effort to encourage Indians to cultivate the arts of their forefathers as well as to abandon many of their ancient customs. One old ceremony that is slowly dying out among the Indians of the Northwest, because of the efforts of the whites to stop it, is the potlatch, a queer feast which greatly impoverished the Indians. At these parties that man is considered the richest who gives the most away, and the Indian host often beggars himself by his hospitality. All the delicacies of the ocean—salmon, herring, and other fishes—are provided, and a dance is held in the evening. The dancing at potlatches is like that at most Indian ceremonials—jerks, gestures, and peculiar stamping, all done in concert. Each man holds in his hands a rattle and the Indians sing monotonously and use queer gestures. Louder grows the singing and higher burns the fire as oil is poured upon it. Finally the dancers toss their headgear, trimmed with feathers, on the ground, fall down exhausted, and lie dormant, while the host begins to recount the traditions of his tribe and the excellence of his house.

A dwindling section of the Indians still cling to the primitive state of the race. At the National Indian Congress, held at Muskogee, Oklahoma, in Oct. 1910, the entire delegation of "blanket" Indians, who were so behind in civilization that they could neither read nor speak English, refused to go on record as favoring the removal of government restrictions on their lands, as desired by members of the five civilized tribes. The "blanket" Indians also favored an extension of the trust period for another 25 years. The present period ends in 1917. They returned to their own lands during the congress, leaving the delegates of the five civilized tribes as its only members.

Another event of interest was the declaration of the legal extinction of the Montauk tribe. Wyandank Pharaoh, living with a few men

INDIANS—INDIAN SCHOOLS

and women near the easternmost point of Long Island, for years called himself the chief of the tribe. In his action to recover Indian Field for himself and his followers, Wyandank Pharaoh said that by right of inheritance he was the chief. The land lies between Great Pond and Oyster Pond, and covers about 1,200 acres. The defendants in the action were the Benson, Pierpont, and Hoyt families or their estates, the Montauk Company and the Long Island Railroad Company. Going back to the original transfer of the land, in 1660, Judge Blackmar said he found that the Montauk Indians were then in possession merely by the right of occupancy. The white people at the eastern end of the island gave aid and comfort to the Montauks in their war with the Narragansetts, enabling them to hold their own, and out of gratitude for this Montauk Point was deeded in part to the whites for the yearly rental of £50 sterling for 10 years. At another time the Montauks were involved in conflict with the Algonquins. The whites again gave aid and there was another transfer of land to the people of East Hampton, as before, the Indians finally agreeing to move to Indian Field. In 1686 all of Montauk Point was deeded by the Indians to the town, they to retain possession at rental of "one ear of Indian corn a year." In these transactions either Governor Nicholls or Governor Dongan took confirmatory action subject to the approval of the Crown. For nearly 200 years the Indians remained in possession of Indian Field, but at the expiration of that time had dwindled to two or three families, had lost their racial characteristics, and, neglecting the land, became the employees of the whites. Finally Arthur W. Benson obtained most of the land by purchase. Then the claim was set up by the Indians that the transfers were improper and illegal. They found that they were destitute of legal rights, not having even the right to sue for the recovery of the property. Later on the Legislature passed an enabling act for them, and again they sued and the case continued to occupy the courts. There is no full-blooded Montauk on the island now. In giving judgment, Judge Blackmar said that Wyandank Pharaoh and his followers might call themselves Indians if they willed, but only after the manner in which an Englishman might call himself a Briton, or a citizen of the United States call himself an American. The Indian, said the Judge, had dwindled out of his tribal rights and had been absorbed by the body politic.

New methods for the handling of Indian land sales have been put in force by the Bureau of Indian Affairs, whereby the Indians will receive at least \$50,000 more per year than under the old system, according to officials of the bureau. Under the new course of procedure purchasers of Indian lands will be put in possession of the land as soon as the sale is approved by the Secretary of the Interior, and the purchaser will not be compelled to wait until a patent is issued. The money will be deposited immediately to the credit of the Indians instead of being held up for three or four months. It is believed by the Indian officials that this procedure will cause greater competition, resulting in increased prices for the lands when it is known to prospective pur-

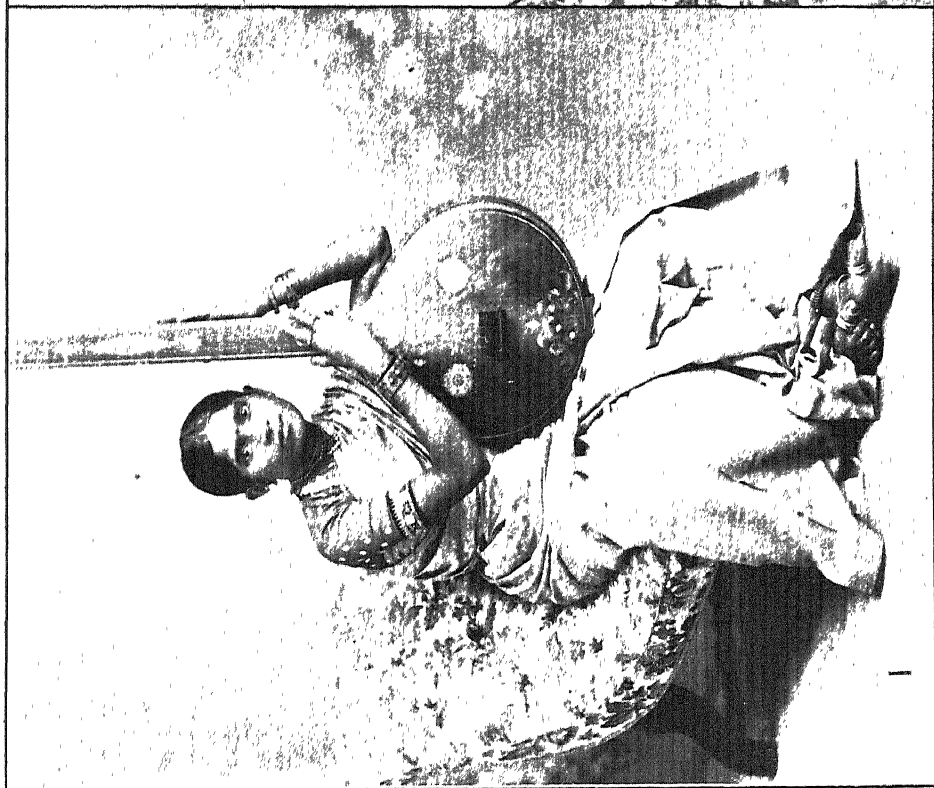
chasers that they may be in possession of the land 60 days after the acceptance of the bid. Indian office records for the last fiscal year show that there were over 212,000 acres of Indian land sold at an average price of \$15 an acre, totaling approximately \$2,700,000. As a result of the visit of Secretary Ballinger and Commissioner of Indian Affairs Valentine, to Oklahoma, all the mal-allotted lands of the five civilized tribes of Indians in Oklahoma, approximating 1,650,000 acres, and the forested area in the Choctaw Nation, amounting to about 1,356,000 acres, were marked out for sale by public auction. The sale, which is by counties, began on 21 Nov. 1910, and will continue to 1 March 1911.

As a means of preserving the languages, legends, religions, traditions, and lore of North American Indians, the department of anthropology of the University of California engaged, in Dec. 1910, the services of Achora Ilungara, a Mojave Indian, and Capt. Jack Jones, one of the interpreters of the tribe. The two Indians were to hold positions in the faculty of the university. Ilungara is known throughout the Southwest as one of the wisest of the medicine men. His knowledge of the history of the race is said to be vast. His lectures are to be placed on graphophone records and kept for future study.

Indian Schools. The progress of the American Indian during the last 15 years has been greater and more promising than in any similar period of his existence. To-day 25 per cent more Indians are self-supporting than were 10 years ago, nearly half of all the Indians in this country speak sufficient English for ordinary purposes, and there are no tribes now idle. Many Indians are at present engaged in lumbering, mining, railroad work, digging irrigation ditches, and otherwise leading active, useful lives. As soon as an Indian can be weaned away from old, tribal customs, progress is generally rapid. A young Indian separated from the confining influences of the reservation and the squaws, almost invariably advances quickly. For this reason boarding-schools are playing the most important part in the educational uplift which is being communicated to the red men. There are several of such schools, and the work performed in all of them is notable. The largest of all schools in the Indian service is situated at Carlisle, Pa. Here the equipment is well adapted to the needs of the pupils, particularly for work in manual training. Among other special features practiced is an outing system, which consists of placing a large number of the Indian girls or boys in trustworthy private families for a part of the year. In this way they can attend school, and receive pay for their services. Many Indians at Carlisle, too, are enabled to earn extra money through farming, the school being located in the heart of a very prosperous farming district.

The school at Carlisle was established in 1879, in rather a peculiar fashion. Four years previous, 74 Indians who had made trouble in the West were brought as prisoners of war to Fort Marion, at St. Augustine, Fla., by Capt. R. H. Pratt. They were put to work, and some, showing an inclination to improve themselves, were taught simple English branches. When their time came to leave 22 of the num-

INDIA.



1 An Indian Singer—Madras



2 A High-caste Maiden—Madras.

INDIAN SCHOOLS—INDUSTRIES

ber voluntarily asked permission to remain and be sent to school. Some were sent to Hampton Institute, while Captain Pratt brought on others from the Dakotas to augment these. Later he decided that it would be wiser to separate these pupils from the Hampton scholars, where negroes as well as Indians were accepted. The War Department concurred in this view and therefore granted the use of the abandoned army post at Carlisle, Pa., for an Indian school. In 1879 the industrial school there was opened and Captain Pratt placed in charge as superintendent, a post which he has occupied ever since. To-day Indians from more than 70 sections are studying together in harmony at Carlisle. All possible branches of activities are taught there, and any graduate may enter the world well-equipped to earn a good livelihood. The system of sending Indians out to live in neighboring families has a vast significance, too, since it not only acts as a helpful civilizing agency on the Indian in question, but also tends to remove the natural prejudices which normally exist on both sides.

Next to Carlisle the most important Indian school is probably Hampton Institute, situated in Virginia. This school is, perhaps, more widely known as an institution for negroes, but, nevertheless, it has many Indian pupils, all of whom are receiving incalculable benefit as a result of the course there. Hampton, though fully equipped for industrial and agricultural work, is primarily a farm school, and the whole system of education there centres in this fact. Both boys and girls work outdoors there. The latter are instructed in farm training, dairying, and poultry raising besides being required to do their share of the planting, hoeing, and weeding. Marketable produce is raised, so that the pupils may have practical demonstrations of the profits which may be gained through intelligent agricultural pursuits. The girls also are taught to cook, wash, iron, and sew, while in the trade school the boys are taught the essentials of the leading mechanical trades. During 1910 about 50 Indian boys took this course, learning bricklaying, woodturning, benchwork, and tinsmithing. All this is in direct line with the school's idea that the ability to obtain food, shelter, and clothing, is of fundamental importance. The girls are also instructed in sloyd and how to make soap, whitewash, mattresses, and cane chairs. Special classes are held, too, in their native industries, where they learn basketry, pottery, rug and blanket weaving, and pillow lace making. The latter is encouraged in the hope that it may ultimately develop into a permanent industry when the pupils return to their own homes. Post-graduate courses are also given in agriculture, business, domestic science, library methods, and matron's work. Besides taking up all the occupations for which such a course of study fits them, many of the young women who graduate from the school engage in school-teaching as a means of livelihood.

Although Carlisle and Hampton institutes are by far the best equipped schools for Indians, there are about 20 others, all of which are doing important work in winning the red man over to complete civilization. These schools are scattered through Arizona, Colorado, Idaho, Montana, Nebraska, New Mexico, Oregon, Washington, and a few in the eastern

States. The schools are all overseen and periodically visited by Miss Estelle Reid, National Superintendent of Indian Schools. One of Miss Reid's particular hobbies is industrial training, and she sees to it that in every one of the Indian schools elaborately equipped industrial courses are maintained. How well the Indian schools do their work is attested by the fact that one of the graduates has become vice-president of a bank in Oklahoma, another is a skilled bookkeeper, many are teachers, successful farmers, section bosses on railroads, and blacksmiths. The mayor of a Nebraska town is a graduate of Hampton. Another student from the same school is at once a teacher, surveyor, farmer, and department clerk. Other Indians, especially on the Pacific Coast, have met with much success in factories while in outdoor work the Indian can scarcely be excelled, as was proved in the case of the Big Horn Irrigating Canal, on the Cree Reservation, which was built almost entirely by them. In fact, in all walks of life, the Indian may be truly said to be waking up. This is what a little kindness, care, and sympathetic instruction along sensible lines have done already, and the movement gives every promise of attaining a wider and wider scope and influence as it advances.

India Rubber. See RUBBER.

Industrial Economy. See MOTION STUDY.

Industries, American, State of. The condition of American industries at the close of 1910 was regarded as only fair, due to a number of factors, all of which, when attended to, are expected to have the effect of stimulating trade and bringing on a period of prosperity greater than anything previously known in this country. Meanwhile, however, these factors disturbing the business world, have prevented an increase in business prosperity which was looked for as a reaction from the financial depression at the close of 1907.

The National Association of Manufacturers started a nation-wide inquiry during 1910, and received replies from 2,000 of its members, making its findings authoritative. Summarized, these letters showed that while some industries were quite prosperous the great majority were slightly below normal. Remedies for this condition, gathered from these letters and tabulated are: Less legislative interference with business; less political activity in this same direction; a speedy and equitable settlement of the railway rate question; more conservatism in business; more national and individual confidence; the taking of the tariff out of politics; reform of the currency and banking systems; prompt decisions on the important industrial questions now before the United States Supreme Court; more attention to foreign trade, and rehabilitation of the merchant marine.

Taking the most important industries separately, the replies gave the following figures:

Agricultural implements showed a fair increase in sales and collection and 72 per cent found condition good, half of these regarding the outlook for 1911 as excellent. The brewing business was in about the same condition, although a larger percentage found business only fair and a smaller number regarded the outlook as more than ordinarily good. In the spirituous liquor trade the condition was only

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fair and a similar future presented itself. Building material and cement showed considerable improvement, but looked for little better than at present. Crockery showed a marked improvement in every respect, 60 per cent regarding the future as excellent, a higher percentage than shown by any other trade. The nearest to it were the paving material houses which presented a percentage of 55. Chemicals, oils, and acids showed a fair improvement, 30 per cent found their condition poor, but 67 per cent believed the outlook good. The drug business had been only fair, but the prospects were good. Food products showed in general a fair condition, but 25 per cent of the packers found their condition poor. All, however, regarded the outlook as good. Glass, in all its forms, ran from good to excellent, but the outlook was only fair to good. The iron and steel trades (an important barometer on business), showed that there was a fair increase in business, but that collections were slow. Those dealing in railway supplies were in peculiar condition, 22 per cent regarding their condition as excellent, and 43 per cent as the exact opposite. The jewelry and silverware situation offered no guide as the reports showed varying conditions. The leather trade was, on the whole, below the normal, one-half the houses producing material for automobiles and general vehicles finding business bad, and the other half fair. Automobiles, in general, however, showed that 60 per cent found the increase in sales excellent, 50 per cent regarded their condition as good, and only 10 per cent had a bad outlook.

Machinery showed a preponderance towards a fair condition, all the milling machinery manufacturers registering in that class; the majority, however, not regarding the future sanguinely. Woodworking machinery is in better condition than the rest, 43 per cent of the manufacturers reporting their condition and outlook excellent. Paper and paper boxes present an indifferent situation, leaning, on the whole, towards fair. In the textile trade (another important barometer), practically none of the manufacturers regarded the future as more than good and the majority summed up their business as fair. In the tobacco business 33 manufacturers found their condition excellent and 44 good. Their outlook about the same. Hardware lines were fair, leaning toward good. This makes a general average of fair, with only a small percentage in very poor condition, but only a few trades able to report industrial conditions as entirely satisfactory.

Infant Mortality, American Association for the Study and Prevention of. This association opened at Baltimore, Md., on 11 Nov. 1910, its annual convention which lasted for several days. "Medical Prevention of Infant Mortality," "Educational Prevention of Infant Mortality," and "Infants' Milk Depots and Infants' Mortality" were some of the topics under discussion. The speakers included Dr. Herman Schwartz, Dr. Ira S. Wile, Dr. T. S. Southworth, Dr. S. W. Newmayer, Dr. W. P. Lucas, and Dr. H. L. Coit. It was noted that there were about 400,000 deaths a year of children in infancy, of which 47 per cent could be prevented if the country exercised its knowledge of sanitary methods. Doctor Wile put a large portion of the blame for this work of human

life on medical schools, for their failure to give adequate training in the principles essential to the prevention of infant mortality.

"It is pretty generally admitted," he said, "that one-half of the infant deaths is preventable. Medical schools do not give sufficient attention to the subject of hygiene or prophylaxis. Education is conceded to be the greatest factor in the prevention of infant mortality. Medical schools do not so train men as to make them capable of teaching nurses, internes, mothers, or philanthropists. There is a total failure to grasp the underlying social conditions upon which infant mortality rests in large part and which physicians must be able to attack in order to prevent infant deaths. The social causes of death are not considered in medical schools."

Doctor Southworth described the popularity of bottle-feeding as partly due to an unwarranted confidence in its safety and partly to the impression created by the makers of the "infant foods" that such products are equal to breast milk. More knowledge, he said, was needed of how the nursing mother ought to take care of herself. Responsibility for popular ignorance rested upon the educator who failed to teach the rising generation of young women the first principles of the care of children, upon the State, which makes lavish appropriations for the improvement of the milch cow and nothing for the study of the nursing mother; also upon hospitals for infants and mothers which, with ever-present opportunity, do not always practice or teach the best methods.

Improper methods of feeding, overfeeding, and weather conditions, were mentioned among the causes of the high infant mortality due to summer diseases by Dr. Herman Schwartz. "Infant mortality," said Dr. H. C. Phillips, "is to be solved, not by philanthropy or by institutions, or by the medical profession or by the State, but by intelligent motherhood." Dr. Anna von Sholly said it was established that the infant reared away from actual contact with its mother did not flourish. "Infants," she added, "brought up in an institution, are notoriously weak. No matter how carefully prepared or how good bottle food may be, it is never as good for a baby as the natural nourishment." Doctor von Sholly also thought that for the good of the next generation the State should support mothers for two years after the birth of each child. There was also, in connection with the convention, an exhibition, in which everything relating to the welfare of the baby was on view. There were good and bad methods of caring for babies, model nurseries, children's hospital wards, and all the latest devices for keeping milk clean and pure. Dr. Charles Henderson, of the University of Chicago, was elected president of the association, and Chicago was selected as the place for the convention in 1911. The permanent headquarters of the association are at Baltimore.

Infantile Paralysis. Infantile paralysis (anterior poliomyelitis) is an epidemic disease, almost unknown until within the past few years—when the cases appear to have been very numerous. The title is somewhat misleading, as older children and even adults occasionally have the disease; but the vast majority of its victims are infants, usually from one to three years of age. In this disease,

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certain small areas of the spinal cord become inflamed, and sometimes the inflammation extends to other parts of the cord, and even to the brain. It is the anterior horns that become inflamed—those parts of the cord which are concerned with muscular movements and development. A lesion of these parts, consequently, means degeneration and atrophy of the parts fed by the nerves, for no part of the body can live after its nervous supply has been cut off.

Infantile paralysis is an acute disease, and because of this, and because of its epidemic form, it has been supposed that it is infectious. This, however, has not yet been proved. Its epidemic character is, however, undoubted. In the summer of 1907, the whole of the Atlantic sea-front was swept by the disease, and in 1909, the disease appeared epidemic in New York, and even extended to Europe.

It is believed that about two-thirds of the cases are due to infection (though there is no direct proof of this), and that the remaining one-third of the cases are due to falls, antecedent fevers, hemorrhages, and other predisposing factors. One attack of the disease is said to render the person immune from another attack for life. There are also numbers of what are called "abortive" cases, in which there is no paralysis. In such cases, there are usually symptoms of various kinds, which indicate that the general health has been upset. There is cold and sneezing; constipation and diarrhoea. In such cases, the virus, whatever it is, seems to have entered the general circulation without finding its way to the spinal cord. The patient gets well, in such cases with more or less rapidity.

The disease proper, however, cannot be mistaken. After more or less severe symptoms, such as have been indicated, accompanied with vomiting, profuse sweating, etc.,—paralysis suddenly develops. This is within the first three or four days. Usually this is not very extensive, being limited to the muscles of one or both legs, but it may effect the arms, the trunk muscles and even those of the face. If it involves the muscles of respiration, it may cause death by suffocation. The more acute symptoms usually disappear in a few days; but for weeks there is noted a great tenderness of the muscles, with contraction or drawing up of the limbs. After this (in those cases which recover), no sign of the disease is left, except the weakened and degenerated state of the muscles, which, however, may be severe, and render the child feeble, if not a cripple, all through its life.

The percentages of deaths from this disease have varied, but they are usually from 6 to 10 per cent. About 25 per cent of the cases completely recover. In the majority of cases, only improvement is noted—moderate or great, as the case may be. It is essential that the treatment be continued for a long time—even after all signs of the disease have disappeared, in order to ensure success.

Infantile paralysis is usually epidemic in late summer and early autumn. As the dust is usually thickest at this time of the year, it has been thought that the dust was responsible for the disease—carrying disease germs from the streets into the lungs of the infected. So far, however, there is no satisfactory evidence that the disease is carried in this way: while

all attempts to inoculate horses with the virus have failed. The theory has also been advanced that the disease is engendered by playing with animals—young children handling them, and so acquiring the contagion. There is no evidence of this, however, and most of the animals, when inoculated, cannot be made to acquire the disease. Again, the theory has been advanced that, inasmuch as the virus is found in the blood, it is probably carried and implanted therein by mosquitos and other biting insects. This is as yet, however, a mere guess; and recent investigations make it probable that the disease is not carried in this way. Again, infantile paralysis has been attributed to wading in streams, muddy pools, etc., but this is not in accord with the fact that very young children and infants-in-arms acquire the disease. So far, its explanation is lacking. There is as yet no satisfactory evidence that it is caused by the food, by water or by milk.

The only positive evidence so far obtained is derived from the experiments of Flexner and Lewis, of the Rockefeller Institute, a year or so ago. They succeeded in inoculating several monkeys with the virus, thus indicating its infectious character. The cords of two children who had died of the disease were obtained, and an emulsion made of them, in salt solutions. A small opening was made in the monkeys' skulls, (trephine opening), and, after the monkeys had been anesthetized by ether, the virus was injected into the brain. Six series of monkeys were experimented upon, in every case the monkeys developed the symptoms characteristic of the disease. The experiments were conclusive inasmuch as, while the first inoculation was from the human being direct, subsequent inoculations were from the cords of the monkeys who had died of the disease. The infectious character of the disease was thus shown to be probable.

As to the nature of the virus, however, there is as yet no definite knowledge. Flexner and Lewis, after a prolonged search, have failed to find any visible body under the microscope. It is said that it is neither a bacterium nor a protozoon. It seems to be of the same nature as small-pox. Its existence, while taken for granted, has not thus far been demonstrated with certainty.

The most probable theory at the present time seems to be that the disease is spread by means of the secretions of the nose and throat, by those who suffer from the disease in abortive or mild cases. Isolation in all suspected cases is, therefore, a wise measure to be adopted. While Doctor Hill, of Minnesota, states that isolation proved of no avail in his cases, it is possible that this may have been due to the fact that it was spread by means of the abortive cases mentioned above. At all events, this seems the most reliable means of staying the disease that has as yet been discovered.

It should be noted, however, that Dr H. W. Frauenthal, of the Hospital for Deformities and Joint Diseases New York, does not believe that the disease is due to these causes, or is carried by infection, in the manner commonly supposed. He believes that the disease is primarily nutritional in character. The fact that it occurs most frequently in warm weather is proof, he contends, that some chemical changes take place in the food, brought about

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by the weather, and which act as poisons upon the child system. The cells destroyed in the cord, he points out, have a nutritive as well as a motor function, and any injury to them gives rise, not only to paralysis, but to impeded circulation and arrest of growth.

During the year 1909, there were 569 deaths in the United States from infantile paralysis—552 of which were among the white children, and only 17 among colored persons. There was a slight preponderance of males over females. The disease was epidemic in New York, New Jersey, Rhode Island, and other States. Quarantine was enforced, and in several cities the public and Sunday schools were closed, at the request of parents who did not wish their children to run the risk of infection. With the approach of cold weather, the disease abated—as is always the case.

As to treatment, none has been found specific. Daily massage, electricity, exercises, alternate hot and cold compresses, etc., are all useful, as correcting deformity and strengthening the wasted muscles. Plaster and steel supports are the worst treatment possible, for the reason that such devices simply increase the atrophy (wasting) of the muscles, by allowing them no exercise. All braces should be simply for the purpose of aiding locomotion and preventing deformity.

All efforts to isolate the germ of infantile paralysis have, however, failed as yet, and no successful experiments have been conducted in which the germ has been made to propagate artificially. If it is an organism which brings these results to pass it is too small to be seen under the microscope. The disease is paralleled by three others in men, rabies, dengue, and yellow fever. In animals it is paralleled by hog-cholera, pleuro-pneumonia, and foot and mouth disease of cattle. No serum has been found for infantile paralysis. In short, it is becoming more and more certain that nothing definite is known as to the reasons for the onset of the disease, which seems to attack the strong and well as readily as the sick.

The mortality of infantile paralysis is indeed great; and it is stated that, during the summer of 1910 alone, there were more than 20,000 cases of infantile paralysis of which about 10 per cent were fatal, and 75 per cent maimed for life. In view of these startling figures, it is not surprising that the State Health Department has attempted to organize a regular warfare against the disease—in an attempt to stamp it out effectually.

Doctors Richardson and Bennet have lately stated their belief in the doctrine that a large percentage of these cases can be cured if they are taken in good time, and the proper treatment be employed. At least, they report progress towards recovery in a large number of their patients. Their treatment is as follows: Small doses of belladonna and a chemical known as "gelsemium" are administered—this latter being made from a herb grown in the Southern States. It is a climbing vine. In the later stages, when paralysis has supervened, electricity is recommended, which seems to be efficacious.

Infra-red Rays. A recent and important series of experiments have been conducted by Prof. R. W. Wood, of Johns Hopkins University, in photography, by means of certain

rays at either end of the spectrum—the ultra-violet and the infra-red. These experiments have been considered very important because by their originality they open up a field of immense size in physics and astronomy. Professor Wood, in 'Notes from the Physical Laboratory of Johns Hopkins,' says of his experiments.

"A screen or ray-filter was constructed by combining a sheet of very dense cobalt glass with a deep orange anilin dye. This screen absorbed all rays below wave-length 6,900. The spectrum of the sun or arc photographed through this screen on a Cramer or Wratten and Wainwright spectrum-plate is reduced from a band extending from λ -6,900 to λ -7,400. The rays within this region are visible to the eye, if all other rays are excluded, but they play little or no part in ordinary vision, on account of their very feeble action upon the retina of the eye. I term them infra-red to distinguish them from the brighter red in the region 65-69. Landscapes photographed through the screen present a remarkable appearance. The grass and trees in full sunlight appear as if snow white, while the sky is as black as midnight. This is due to the fact that the chlorophyll of the vegetation reflects this infra-red light very powerfully, while the light of the blue sky is nearly or wholly wanting in it." It is hoped that this method of photography will prove of great use in astronomical research.

Ingot Iron. See METALLURGY.

Initiative and Referendum. There has been so much legislation and so many articles in State constitutions making provision for the initiative and referendum that it is possible to state, in a general way, the present status of this method in lawmaking. The system is alternative everywhere. Its strongest supporters have never considered the abolishing of legislatures, but merely supplementing them with law making by popular vote. The movement is not confined to any section of our country, though the initiative and referendum was first adopted in parts of the West. It is not, strictly speaking, a political issue, since both parties in various States are on record as favoring it. We may say generally that the radical wing of both parties favors an initiative and referendum, while the conservatives are opposed. The initiative is always coupled with the referendum. It is the power given the people to propose measures. It cannot stand alone. For the referendum is required to carry into effect, the legislation asked for by the initiative. The most important system of the initiative and referendum is that of Oregon. Many of the other States, in framing a similar system, have adopted the Oregon plan in whole or in part, and the feasibility of this method in lawmaking has been based in many quarters on the workings of it in Oregon. In that State the legislative authority is invested in the usual State body, but the people have reserved the power to propose laws and amendments to the constitution and to enact or reject the same at the polls, independent of the legislative assembly; and they also reserve the power to approve or reject any act of the legislature. An initiative petition must be signed by 8 per cent of the legal voters, as shown by the vote for Supreme Judge, at the last preceding general election, and be filed with the Secretary of

INITIATIVE AND REFERENDUM—INJUNCTIONS

State not less than four months before the election. A referendum petition need only be signed by 5 per cent of the voters and filed with the Secretary of State 90 days after the final adjournment of the Legislature passing the bill on which the referendum is demanded. The Legislature may also refer to the people any act passed by it. The veto power of the governor does not extend to referendum measures passed on by popular vote. It is also provided that the Secretary of State shall, at the expense of the State, mail to registered voters, a printed pamphlet, containing a true copy of the title and text of each measure that is to be voted upon and the opponents and proponents have a right to insert in the pamphlet, at the actual cost to themselves of paper and printing only, such arguments on the subject as they desire to present. These pamphlets must be mailed not later than 55 days before a general election and 20 days before a special. Up to 1910, the people of Oregon had voted on 23 measures submitted to them under the initiative, five under the referendum, and four referred to them by the legislature. There were 19 measures submitted at one election. The last election, 1910, had 32 propositions for them to vote upon. Some of the more important measures related to the liquor traffic, woman's suffrage and the liability bill, the latter submitted by the labor organizations through means of the initiative. Oklahoma was the first State to embody the initiative and referendum in its original constitution. The Oregon plan is generally followed, except that the system is made applicable to items and parts of acts and to county, district and municipal legislation. While self-executing, the constitution provides further legislation "to prevent corruption in making, procuring and submitting initiative and referendum provisions." The people of Missouri have the distinction of being the first to ever defeat a proposal for the initiative and referendum. In 1903, the Legislature of that State adopted a joint and concurrent resolution proposing a constitutional amendment, which provided for the initiative and referendum, along the lines of the Oregon plan. The electors rejected it. In 1907, the Legislature made a second attempt, submitting the proposal in slightly modified terms. It came before the voters at the general election of 1908. The Legislature of Montana passed an initiative and referendum act in 1907. The details of procedure were regulated and the Oregon plan for instructing the voters by means of literature furnished by both sides was also adopted. Delaware extended the initiative and referendum to the question of whether liquor licenses should be granted. The Legislature of Maine in 1907 proposed a constitutional amendment for direct popular legislation. Some of the prominent features of the Oregon plan were included. The act also provided for public hearings before the legislature and for selection from several competing measures. This amendment was adopted by a large majority at the State election of Sept. 1908. The constitution of North Dakota also provides for the initiative and referendum. Many of the features of the Oregon plan are adopted, but it is expressly declared to be self-executing and fixes as the basis for determining whether a measure has received a popular majority, the vote cast for justices

of the Supreme Court. The initiative and referendum is being largely used in the cities, towns and counties to decide questions of such local import as local option, the issuance of bonds and the undertaking of new public enterprises. The movement is either advisory or mandatory. The advisory system aims to secure action by milder methods than direct legislation. The voters are allowed to suggest legislation or express their opinion. This system is in vogue in Detroit, Grand Rapids and Buffalo. The advisory method is also followed in Toronto and Victoria. Illinois has what is called a Public Opinion bill. Under it, the petition of 25 per cent of the voters is sufficient for a referendum. Augusta, Maine, has a novel provision in its charter, providing for the meeting of citizens to consider the public good and also to instruct their representatives. Special elections for the expression of public opinion are authorized. The same provision in the Massachusetts constitution is repeated in the city charters, but little advantage has been taken of it. Some of the smaller cities have held a few meetings, but this is as far as it has gone. There is a strong movement to extend the operation of the referendum to franchises and making it mandatory for them to be submitted to popular vote. Iowa and Indiana each have optional referendum on water, light and similar quasi-public corporations. In Ohio, the franchise for street railways must become subject to the referendum if 15 per cent of the voters petition therefor within 30 days after the granting of the franchise. The charter of Memphis, Tennessee, has the same provision. Nebraska provided for local initiative and referendum in any town or city where the voters so elect. Lincoln and Omaha have done so. Various forms of the same system are now in operation in South Dakota, Oregon, Montana, Maine, and Oklahoma. The initiative and referendum is in the charter of San Francisco and Los Angeles and several other cities in California. The recall (q.v.) is also in operation in most of them. Direct legislation has also been established in Seattle, Spokane and Everett, of Washington. Those cities ruled by the commission form of government have also provided for it. Some are Galveston, San Antonio, Houston, El Paso, Fort Worth, Greenville, Dallas, and Waco. Des Moines and Cedar Rapids have adopted the Los Angeles plan. Lewiston, Idaho, Sioux Falls, Leavenworth, Haverhill, and Gloucester have done the same. The new Kansas City charter provides for it also. Newport with a council of 195 members has in addition the initiative and referendum.

Injunctions. The controversy over this exercise of power by the courts in equity is confined to its application in labor disputes. So far as the injunction has been resorted to in other cases, there is no controversy. The theory of the injunction in labor disputes is that property rights are being invaded. There is much diversity of opinion as to what constitutes property rights. How far is a man's business that is not tangible, property rights? The controversy over injunctions has been brought about in this way: the employer fighting a strike has gone into courts of equity and procured an injunction or restraining order, forbidding his employees from doing what they consider necessary in order to win. Many of these injunc-

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tions have been of the widest character, prohibiting picketing, molesting or even speaking to those still at work and prohibiting any move that might savor of the boycott. It was for the violation of the last-named provision in an injunction that Samuel Gompers was charged with contempt. The employees contend that in granting such injunctions, the court has gone beyond its proper function and legitimate jurisdiction and by the exercise of summary powers in contempt cases, has virtually deprived them of trial by jury and other rights guaranteed by the constitution. The granting of the injunction practically determines the litigation in advance. It therefore in a sense supersedes the trial by jury. There is a sentiment in favor of the modification of the powers of the Courts in granting these restraining orders. President Taft gave expression to it in his message to Congress in 1909. He asked for the enactment of a statute forbidding the issuing of any injunction or restraining order, whether temporary or permanent, by any Federal court, without previous notice and a reasonable opportunity to be heard on behalf of the parties enjoined; unless it shall appear to the satisfaction of the court that the delay necessary to give such notice and hearing would result in an irreparable injury to the complainant and unless also the court shall from the evidence make a written finding, which shall be spread upon the court minutes, that immediate and irreparable injury is likely to ensue to the complainant and shall define the injury, stating why it is irreparable; and should also endorse on the order issued, the date and hour of the issuance. The President also recommended that every injunction or restraining order issued without notice and opportunity to the defendant to be heard, should by force of statute expire and be of no effect after seven days from the issuance thereof or within any time less than that period which the court may fix, unless within such seven days or lesser period, the injunction or restraining order is extended or renewed after previous notice and opportunity to be heard. In addition to this, many who favor the modification of the injunction also urge that if an act prohibited by it is a criminal act for which a jury trial may be had under the constitution, the person charged with the contempt should have a right to a jury trial in the same court or have his case transferred to the criminal court. But aside from this view of the general public, that of the unions on one hand and the employers on the other, is important to enable one to understand the point at issue. We give the union first.

The jurisdiction of courts of equity in the granting of injunctions extends only to the protection of property, the improvement or destruction of which could not be adequately compensated for in damages. Courts have enjoined the physical acts of trade unions, such as nuisance or trespasses which have interfered with the enjoyment or transfer of property. Of this no complaint can successfully be made. They have gone further and said to members of the Union, "You shall not say to another, not of your own membership, 'such a man is an enemy of ours and we request you do not buy his products until we are fairly dealt with by him.'" Some judges have even said, "You shall not bind each other not to deal with that

man." The contention of the unions is that those injunctions do not protect property since the plaintiff's property and his rights thereto are equally intact after as well as before the supposed injury complained of. His market may have been restricted, not by a physical fact but a mental one, the attitude of the purchasers toward the seller, an attitude in which the would be complainant has no more property right than has the liquor dealer facing a temperance wave in the appetite of his theretofore customers or a packer in the sale of public beef or other products. Granted that if a customer can be driven away by illegal threats, such as violence, an injunction may issue, but when the courts have sought to enjoin men from communicating to their fellows their opinion of another or of the desirability of the purchase of his products, they have departed entirely from the theory that equity may only defend the rights of property, as property and have sought to create an anomalous right, not defined in any law book and not being a right of property over which the courts of equity have been believed to possess jurisdiction. Some courts have urged that an employer has the right to have labor flow freely to him and issued injunctions to enforce this right. If there be no nuisance interfering with the movement, the unions deny that the employer has a right to appeal to equity to clear away the channels of labor and trade. If that be the rule, why could not a department store be enjoined if it advertised that it sells goods cheaper and better than its competitors or a cigar manufacturer who asks the public to smoke cigars that are factory made instead of those made in the sweat shop? Both are interfering with the flow of trade to their competitors. The Unions cite in support of their argument, the British Trades Dispute act of 1906, which is important enough to be set forth here. It provides that an act done in pursuance of an agreement or combination by two or more persons shall, if done in contemplation or furtherance of a trade dispute, not be actionable unless the act, if done without any such agreement or combination, would be actionable. It shall be lawful for one or more persons, acting on their own behalf or on behalf of a trade union or of an individual employer or firm in contemplation or furtherance of a trade dispute, to attend at or near a house or place where a person resides or works or carries on business or happens to be, if they so attend merely for the purpose of peacefully obtaining or communicating information or if peacefully persuading any person to work or abstain from working. An act done by a person in contemplation or furtherance of a trade dispute shall not be actionable on the ground only that it induces some other person to break a contract of employment or that it is an interference with the trade, business or employment of some other person or with the right of some other person to dispose of his capital or his labor as he wills. An action against a trade union, whether against workmen or masters or against any members or officials thereof on behalf of themselves and all other members of the trade union in respect of any tortious act alleged to have been committed by or on behalf of the trade union shall not be entertained by any court.

Here is the opposing view of the employers:

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When the rights of a citizen are invaded he gets remedies first upon the common law side of the court, then upon the equity. The equity side gives to the suitor, a preventive remedy: the common law, a remedial. The equity side seeks to prevent the doing of an injury the common law gives damages when the wrong is committed—after the injury is done. The equity side proceeds upon the most intelligent civilized idea, it prevents the commission of wrong, the invasion of personal rights. An injunction issues when irreparable injury is threatened. Irreparable injury justifying the injunction may be such either from the nature of the injury itself or from the want of responsibility in the person committing it. It is denied that a property right is that of a mere ownership in a house or lot, of lands or personality. Man owns the labor of his head no less than that of his hands, of his pen no less than that of his pick, of his learning no less than that of his product, of his profession, no less than that of his trade. The constitutional guaranty of liberty and property as interpreted by the Supreme Court embraces not merely the right of a citizen to the free use of his powers and faculties in all lawful ways, to live and work at any trade, profession or business, but for that purpose to enter into all contracts that may be proper, necessary and essential in his carrying out the purposes mentioned. There is no force in the argument that a combination of men should not be prohibited from doing what a single individual can. See *Montague vs. Lowry*, 193 U. S. 98. For not only does a combination of many possess a power beyond that of any individual, but when it is organized and acts to accomplish a particular purpose, it is itself a new entity in which the judgment and will of the individual components is subordinated to the purpose and motive of the combination. The power of one man to coerce, intimidate or threaten is obviously a very different matter from similar actions by members acting in concert, whose very presence becomes in itself a menace to the peace of mind and the right to the free flow of custom possessed by a person, who, for instance, becomes the recipient of the attentions of a labor combination in a labor dispute.

Late in Dec. 1910, the Moon anti-injunction bill, having passed the House, was still in the hands of the Senate judiciary committee, which had referred it to a sub-committee. It was expected that this sub-committee and also the committee would report in favor of its passage, and that it would come up for discussion in the Senate in one of the ablest debates on the powers and limitations of the courts. It was anticipated there would be powerful support for the bill if it should come from the judiciary committee, and also powerful opposition to it. Organized labor was opposed to it. The bill requires notice and hearing before an injunction can be issued, and amounts in effect to legalizing the injunction, which, the labor leaders say, would do harm. The supporters of the proposed legislation say the measure is valuable because it would crystallize into law the existing practice; but there are some able lawyers in the Senate who assert that the law must recognize the injunction, and that the Moon bill is a force so far as giving labor any relief is concerned because

it does not specify on what terms injunctions shall issue. Strong support is found in the Senate for the proposition that a judge should be enabled to punish for contempt for violation of an injunction only when the contempt is committed in his presence. Otherwise, it is insisted there should be a jury trial. This is the doctrine William J. Bryan talked freely in his last presidential campaign, and it is the view held by a good many in the Senate, without regard to partisanship.

Insanity. Recent investigations and treatment of the insane have shown great promise for rapid improvement in the future, both in the condition of the patients themselves, and in the means of cure that must be taken to offset this dread disease. Rational methods of treatment along psychological lines, have already worked wonders; and there is every indication for more rapid improvement in the future. Until a few years ago, anatomical causes for insanity were always sought for; but it is now known that only in a certain percentage of cases is there any definite discoverable deterioration in the cerebrum. In other cases, the cause of the disorder seems to be in the blood; in still other cases, the cause seems to be purely psychological,—due in some way to the dissociation of the personality, and in such cases, psychological—and not physiological—treatment is the rational means of cure.

Experiments recently conducted on Ward's Island, and in the Long Island (N. Y.) Hospital for the Insane, have demonstrated the fact that active, healthful occupation of the mind and of the body go far towards relieving the acute and chronic insanity. This is largely due to the initiative of Doctor Malton, head of Ward's Island Hospital.

Whereas there was one "insanity" a few years ago, which covered every case in which the mind was unbalanced, there are now a large number of varieties of insanity, which are diagnosed and subjected to different treatment. There can be no doubt that insanity is increasing at an alarmingly rapid rate—especially in England and America. Dr. Forbes Winslow, a noted alienist, of London, recently stated that, if the present increase in the number of the insane continues, it will not be many years before the number of the insane outnumber the sane. He says:

"By a simple arithmetical calculation, it can be shown the exact year when there will be more insane persons in the world than sane. We in England are gradually approaching, with the decadence of our youth, a near proximity to a nation of madmen. By comparing the lunacy statistics of 1869 with those of 1909—four decades having intervened—my reflections are sad indeed. A terrible but real curse is in store, and an insane world is looked forward to by me with certainty, in the not far distant future.

"In 1869, out of a population of 22,223,299, there were 53,177 registered lunatics in England and Wales,—there being one lunatic in every 418 of the total population; whereas in 1909, out of a population of 35,756,615, the number of registered lunatics was 128,787,—making on the average one lunatic in every 278 of the population; so that in 40 years an enormous increase in lunacy is seen."

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There is good reason for thinking that this may be an overstatement of the case, however. Thus, when patients are detained year after year in public hospitals, they are counted over and over again, and thus it would appear that there are different individuals, whereas, as a matter of fact, there is but one. An example of this is the following. A patient died recently at the Utica State Hospital, who had been admitted in 1843, she had been counted in 65 annual enumerations. Were this method followed, it could be proved that 1 in every 280 of the general population of the State of New York was insane—a close parallel to England. But if only the number of patients admitted for the first time to any hospital for the insane during the year were counted (a far more reliable measure) it could be shown that the ratio is only 1:1600, or, if only those over 16 years of age were counted, 1:1000. This is far more hopeful. On the other hand, the number of admissions during the year is certainly startling. During 1909, 5,301 patients were admitted to hospitals for the insane in New York State. Of this number, none were admitted before to any similar institution.

The question now arises, Is insanity preventable? There is every reason to think that a large percentage of the cases can be prevented—if only adequate measures were taken; as the following figures will show.

Of the 5,301 cases above mentioned, 638, or about 12 per cent, were cases of alcoholic psychoses. Again, of the above number there were 664 cases, or again 12 per cent, who were suffering from general paralysis. Together, these total about 25 per cent of the whole number admitted—about one-quarter. These two causes alone—both of them preventable—were, therefore, responsible for one-quarter of the insanity reported in New York State last year. As general paralysis is certainly due, directly or indirectly, to syphilitic infection; and as the causes of alcoholism are obvious; these two causes, if eliminated, would mean the prevention, annually, of thousands of cases of insanity—with attendant, economic, social and moral relief.

As to the treatment of insanity, this has not progressed as rapidly as might be wished. The study of abnormal psychology (q.v.) has, however, shown that many diseases of this character may well be due to purely mental causes—without accompanying anatomical lesion; so that mental methods of treatment—such as hypnotism—are now being tried, instead of the more heroic methods of a generation ago. This is certainly a step in the right direction; and results of great importance should accrue within the next few years, as a result of the newer systems and methods in vogue.

One fact of great importance, in this connection, is the establishment of a National Committee for Mental Hygiene; intended to better the condition of the insane in all public and private institutions. The secretary, Mr. Clifford W. Beers, author of a book entitled 'A Mind that Found Itself,'—was himself in an institution for several months; and his book is the result of his experiences. The movement has become nation-wide; and there is every reason to hope that some results of great interest and importance will be achieved within the next few years.

The relation between alcohol and various forms of insanity has long been known, and the more recent investigations have but tended to confirm this fact. Doctor Katzenellenbogen stated recently before the State House in Boston, that, although he came from a nation of whiskey drinkers, men did not become insane or die in Germany as they do in this country. He thinks that the brand of the whiskey has much to do with this result. "Maine whiskey" he said, "kills and does not simply cause cases of insanity. In Europe it is extremely difficult to get alcohol at a drug store or elsewhere unless you have a genuine prescription for it, while here you can not only get alcohol, but morphine and cocaine at almost any drug store without trouble. . . I doubted the fact until I personally tried, and did purchase it in six stores without trouble of any kind. . . To sell cheap whiskey that kills ought not to be punishable merely by a fine of \$50 or \$75, but by imprisonment for a good term."

To prevent the frequent escape of criminals "acquitted because insane" the Society of Medical Jurisprudence made public its attitude, which looked toward an amendment of the criminal law, so that such persons should hereafter be judged "guilty, but insane," and if they regain sanity be punished according to law. Among the reasons for this new attitude, emphasis was laid on the abuse to which the writ of habeas corpus had been put in freeing insane persons who were a danger to society and themselves. The resolution defining the Society's attitude was adopted after an address by John Brooks Leavitt, in which he said that to the layman there were only two kinds of insanity: medical insanity, which seemed to be ordinary insanity, and legal insanity, which permitted a man to do any crime and get out of paying the penalty. Mr. Leavitt said:

"Our struggle in this State of New York, is not to keep insane men from getting out of so much as to keep sane men from getting into the asylums in order to escape the penalty of their crime. You all remember the disgraceful trial of only a few years ago, when there was no earthly hope of escape for the criminal except by pleading insanity. Then follows a private consultation between lawyer and client, in which the client is asked to name all the queer things he ever did in his life. Whip these facts into a hypothetical question, pay a heavy medical fee for a specialist to frame it, let him swear the client into insanity and six months later let him swear him jauntily out, and the criminal escapes scot free except for the fees.

"To remedy this farce, let us by law change the customary verdict from 'acquitted, because insane' to 'guilty, but insane.' The crime has been done, and it makes no difference to society if it has been done by a lunatic or a sane man; and as a protection to society, the criminal, sane or insane, must be confined. Then let his lawyer in that little private consultation after the murder, bid his client choose alternatives: 'If you want to be insane, you will be locked up for life! If you want to be sane, you will be hanged. Now choose!' Then there will be no large medical fees, and no one will be the worse except your lawyers and doctors." A committee was appointed to confer with a similar committee from the State Bar

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Association, with a view to recommending the change suggested to the legislature.

It seems that during the 50 years of its existence, up to 1909, the Matteawan (N.Y.) State Hospital, an institution devoted exclusively to the criminal insane, had received 3,160 patients. Of this number 313 had been indicted for homicide, and 598 for burglary, so that a large proportion of the total number committed or transferred to Matteawan were more or less dangerous to the public peace and safety, and it costs the people of the State of New York about \$250,000 a year for protecting themselves against crimes by those insane.

Insecticide Act. The Insecticide Act of 1910 became effective on 1 Jan 1911. The act forbids the manufacture or sale in Federal territory of adulterated or misbranded insecticides and fungicides, especially mentioning Paris green and lead arsenate. It also forbids interstate shipment of such articles, and this is its most important feature.

Paris green is considered adulterated if it does not contain at least 50 per cent of arsenious oxide, on the other hand it must not contain arsenic in water-soluble forms equivalent to more than $3\frac{1}{2}$ per cent of arsenious oxide; and no substance may be mixed with it so as to lower its strength. Lead arsenate is counted adulterated if it contains more than 50 per cent of water, or if its total arsenic is equivalent to less than $12\frac{1}{2}$ per cent of arsenic oxide, or if it contains arsenic in water-solution forms equivalent to more than .75 of a per cent of arsenic oxide, or if any substance is mixed with it so as to lower its strength. If lead arsenate contains more than 50 per cent of water it must be labeled "lead arsenate and water," and the extra percentage of water must be plainly stated. Any other insecticide or fungicide is considered adulterated if its strength or purity fall below the standard under which it is sold or if any substance has been wholly or partially substituted for it, or if any valuable ingredient has been even partially removed, or if it is intended to be used on vegetation and is injurious to vegetation. If the designation of an article imports the presence in it of a certain substance, that substance must be present in the customary amount.

Any insecticide or fungicide is misbranded if the label bear any statement, design, or device that is false or misleading in any particular, either as to the character of the article or as to the place of manufacture. And the term "label" is defined so as to include any circulars, etc., that are packed with the article or referred to either on the label or on the circulars accompanying the article. If the contents are stated in terms of weight or measure, they must be correctly stated. If an insecticide or fungicide (other than Paris green or lead arsenate) contains arsenic in any form, the total amount of arsenic and the amount of water-soluble arsenic must each be stated on the label. The amount of inert substances (often called "filler") must also be stated.

The law and the regulations apply also to imported goods, imported lead arsenate or Paris green being treated as being intended for use as an insecticide unless the contrary is shown. The Treasury Department and the Department of Agriculture will cooperate in taking samples of imported goods.

Insects, Destructive. The amount of damage done by various parasitic insects each year is very great; it is asserted that the boll-weevil alone does \$25,000,000 damage a year to the crops. These, like nearly all other insects of the kind, are inactive in the winter time, only coming to life and activity in the spring; and for that reason the Government experts have long recommended the farmers to destroy their crops of cotton, etc., in the fall, by burning, and in this manner get rid of millions of potential boll-weevils. This advice was not, however, as a rule accepted; and the farmers continued year after year to leave the remains of their crops standing, to be burdened the next year by the insectivorous pests. As a result, the experts of the Department of Agriculture have devised various methods of dealing with these insects in the winter time, the period of their inactivity. It is well-known that the weevils can only live through the winter months, if they are provided with a certain shelter; and if that shelter be lacking, they will almost certainly perish. One of the chief factors in ridding the fields of this pest is, therefore, to gather up and burn all rubbish, grass, weeds, dead leaves or other litter,—in or under which the weevils might find a shelter during the cold months. In order to study the effects of various environments upon the weevils, large cages have been built, separated by wire netting. In these large cages, the weevils are studied. One of the cages was virtually bare; another contained dead leaves; another old cotton stalks, etc. The results of the experiments, so far conducted, are thus summed-up by M. Rene Bache:

"The most important measure to prevent the cotton boll-weevil from living over the winter is to destroy the plants in the fields, after the crop has been gathered. This is to be done at least three weeks before the first frost is expected.

"Clean up the field in the fall and destroy, by burning or otherwise, all dead leaves or other rubbish.

"Destroy all weeds and grass along the fences at the edges of the fields. These harbor weevils.

"All 'volunteer' or sprout-cotton, developing in advance of the main crop, should be destroyed before it forms buds—otherwise it is liable to feed and breed weevils that will attack the main crop later."

In addition to the boll-weevil, the brown-tail moth, the corn-ear worm, the pear thrips, the potato bug, and various species of field insects, all of which destroy millions of dollars worth of crops and produce every year, may be best assailed in the winter.

Of late, thousands of a small ant-like insect, called Kelep, have been imported from Guatemala, to fight the boll-weevil, as it is believed that they are natural enemies. It is hoped that, as the result of the present experiments of the Department of Agriculture, the time is not far distant when the boll-weevil will be exterminated; and if that is the case, it will mean the saving of thousands of tons of grain and millions of dollars every year.

Insurance. During the past three years, the field of insurance has broadened. The policies of former days are of the past. Insurance in these times seeks to meet conditions brought

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about by the inventive genius as well as the enterprise and thrift of the people. As a result, new and novel lines of business are being developed that some day may be as important factors in the prosperity of the companies as the ordinary life, fire, and accident policies are to-day. Today aeronautics has already begun to play a part in insurance. The question has come up whether aviators holding the ordinary life or casualty insurance policy are taking risks in their flights which vitiate it in case of accident or death. The New York Life has a special aeronautic clause, under which there is no insurance against death, resulting within two years from the date of the policy, where it is caused by experiments or ascensions or journeys in balloons, aeroplanes, or other devices for aerial locomotion. The French insurance companies will not insure any airmen. But when aeronautics becomes part of our commercial life, the insurance companies will enter that field and take risks, the same as they do at present with other hazardous occupations. A most novel policy taken out during the year was an insurance against assassination. The insured was a young millionaire, living in the country where the activities of the so-called Black Hand were manifest. If he is assassinated or any attempt made upon his life, the company will pay \$5,000, of which \$2,000 is to go to the first witness, and \$1,000 each to the other three who may supply evidence regarding the deed. A form of insurance which has grown quite common during the last few years is that taken out against rain. The merchants who depend upon good weather during holiday and other busy seasons are beginning to obtain these policies. This insurance is also being used by men interested in open-air enterprises and the day may not be far distant when all such events will be protected by proper policies against rain. The only question is the rates, which are apt in most cases to be very high.

The life insurance business is prospering. There has been much new paid-for business during the past year. In fact one company reported an increase of 50 per cent and those in New York, New Jersey, Massachusetts, Pennsylvania, Ohio, and other States had similar stories to tell. The systematic instruction of the agents was a feature in 1909. Many policy loans were looked for. Most of the companies reported "decrease" or "little change." There was a heavy demand for insurance by the heads of various corporations and firms for the protection of business interests. This is a growing field. The most popular policy during the year was the 20-payment life policy. Of the new business, New York and the principal Western States obtained the lion's share. An important measure enacted in New York provides for the extension of the period of renewal commission of agents, the amortization method of valuation of securities and the substituting standard provisions in policies for standard forms. Many companies reported an increase in their dividends which are to be payable during 1910 to the policy-holders.

The underwriting profit in fire insurance for 1909 looked very promising up to the last week of December. The fires during that period affected it, seriously, though not enough to prevent 1909 to be a gain over 1908. There

was little change in the premiums despite their increase in volume. The rate remains about what it was in 1908, though some underwriters thought there might be a decrease. During 1909, the National Board of Fire Underwriters submitted to the National Conservation Committee, enactments and ordinances relative to building construction, investigation of fires by State officials, the enforcement of rules to govern the use and storage of explosives, the removal of refuse and waste and the supervision of electric wiring. Kansas passed a rate law and Texas is preparing to do the same. The most unprofitable risks according to some of the companies in 1909 were lumber and wood-working establishments.

The demand for liability insurance was brisk throughout the country, especially in the larger cities. The agitation in many sections for a workman's Compensation Act and the extension of liability on part of the employer were the big factors for the year in this field. Much consideration was given to the subject in New York. Governor Hughes made it one of the features of his message to the legislature. Wisconsin and Minnesota also manifested great interest in the subject. Automobile insurance was also an important subject during 1909. Some phases of it covered were liability, property damage and collision. The most disastrous risks in this field were structural steel, contractor's schedule, risks covered under the metal schedule, i. e. machine shops and risks involving stamping foundry works and automobile collisions.

The Fidelity and Surety business was good in all sections. While there was an increase in premiums, the losses were also larger due in a measure to the panic. Many of the losses sustained were on contractor's bonds. During 1909, the Townser Surety Rating Bureau was established. A leased wire service was also started between New York and Chicago by one of the largest companies. The rates charged by the company for bonds for Federal employees are now subject to regulation by act of Congress.

The insurance departments of the various states have been maintaining active supervision of the affairs of the companies. This was particularly true with those of New York, Massachusetts, Minnesota and Michigan. In New York, the Superintendent is now clothed with the authority to take possession of the property of any insurance company if necessary for the protection of policy holders. The credit insurance people doing business in that state were also ordered to increase their reserve. Massachusetts obliged them to do the same. Many of the rulings of the New York department related to the limitation of expenses and the standard provisions of the policies. More than 825 forms of policies were submitted to that department.

The United States Supreme Court at its January 1911 term in the case of Foster K. Hale, Jr., plaintiff in error against The German Alliance Insurance Company of New York held as constitutional a statute of Alabama providing for an additional punitive payment of 25 per cent "if at the time of making such contract or policy of insurance or subsequently, before the time of trial, the insurer belonged to or was a member of or was in any way connected with any tariff association or such

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like thing by whatever name called, or which had made any agreement, or had any understanding with any other corporation or association engaged in the business of insurance, agent or otherwise, about any particular rate or premium which should be charged or fixed for any kind of classification of insurance risk. "The penalty of this 25 per cent goes to the insured and his right to it cannot be effected by any signed waiver. Justice Harlan in writing the opinion of the court overruled the contention that the statute was taking property without due process of law, stating that the Alabama statute was aimed at monopolies and that any relevant method pursued in achieving that object was not taking property without due process of law. The State evidently considered an association fixing the rates of insurance as an evil of monopolistic sort. It could even prohibit such companies from doing business within the State and therefore in like manner might add the penalty in question. See also INSURANCE, LIFE; INSURANCE, FIRE; INSURANCE, CASUALTY; INSURANCE, MARINE; and FRATERNAL ORDERS.

Insurance, Bank. See BANK INSURANCE

Insurance, Burglary and Theft. See INSURANCE, CASUALTY

Insurance, Casualty. This insurance takes in all classes save life, fire, and marine. The subjects contemplated by the term, in its broadest sense, are Personal Accident, Automobile Collision, Automobile Liability, Automobile Bail Bonds, Bicycle Accident, and Theft, Burglary, Common Carrier's Liability, Credit, Dentist's and Druggist's Liability, Elevator, Employee's Liability, Fidelity, Fly-wheel, General Liability, Health, Income, Investment, Key Registry, Landlord's Liability, Live Stock, Machinery Breakage, Mortgage Guarantee, Patent Title Guarantee, Physician's Liability, Plate Glass, Plumbing and Water Leakage, Public Liability, Railway Installment, Registered Mail, Safe, Sprinkler Leakage, Steam Boiler, Surety, Team, Vessel Liability, Workmen's Collective and Workmen's Compensation. For 1909, the most important development was the large number of new companies organized, partly organized or projected, aggregating 38 in number, with a proposed capital of \$14,550,000, and a surplus of \$4,000,000. Ten have started in the Southern States, mostly in Texas and Georgia. The Middle West is the home of 16. Indiana and Missouri have the most, not merely in number, but also in capitalization. Two of the new companies have been formed on the Pacific Coast. Five new companies started in business on 1 Jan. 1910. Their combined capital is \$1,110,000, and the surplus \$505,754. During 1909 and early in 1910 seven new companies then in business increased their capital to the amount of \$2,250,000. There was at the close of 1909, 175 stock companies doing a casualty, surety, and miscellaneous insurance business in the United States. Their combined capital was \$59,454,395; total assets, \$265,804,030, and net surplus, \$59,748,222. The premiums written during 1909 aggregated \$77,189,039. Losses paid excluding expenses for investigation, adjustment and legal fees, amounted to \$31,890,081. The management expenses including commissions, equalled \$40,204,792, and the dividends paid, \$5,320,023. In 1908, 141 companies were doing business with a capital of \$61,615,063.

Their total assets were \$250,340,985; liabilities, including capital, \$171,287,727; net surplus over capital and liability, \$60,852,943, total net premiums, \$73,332,978; and total income, \$84,295,656. The payment to policy holders that year was \$30,404,759, and the dividends \$5,274,399. The actual expenses of management, including taxation, were \$38,430,718. In 1907, there were 144 companies doing business, with a capital of \$58,393,135 and total assets of \$214,854,156. The liabilities, including capital, were \$163,253,335, and the net surplus, over capital and liability, was \$51,600,821. The total premium receipts were \$70,027,619. For 1907 the total income was \$84,474,354. The total payment to policy holders was \$28,182,004, and the dividend to stockholders, \$4,992,853. Actual expenses of management was \$36,231,018, and the total expenditures, \$71,516,626.

An important phase of liability insurance during the year of 1909 was the appointment of a commission by the New York Legislature for a more adequate plan of compensation for industrial accidents. A similar commission was appointed in Minnesota and legislation enacted along the lines of its report. The commission appointed in New York conducted public hearings in the various cities throughout the State and also addressed a series of printed questions to the employers of labor and also to companies transacting liability insurance business in the State. It drafted two laws, both of which were passed by the Legislature and took effect September 1910. The first amends the labor law in reference to employer's liability, and the second in reference to workmen's compensation in certain dangerous employments. Ohio passed a most drastic measure in 1910 on the same subject. It is known as the Norris bill. In 1906, a Federal law affecting employers of Common Carriers was enacted. The United States Supreme Court declared it unconstitutional, and another act was passed in 1908 to meet the objections of the Court.

In 1909, there were 26 companies engaged in the liability branch of business in the United States. Of this number, 20 were American stock companies, 1 mutual, and 5 foreign companies. The total premiums written aggregated \$25,500,000 and the total losses paid, \$13,300,000. The most important step forward in the underwriting of liability insurance was the passage in 1905 of the loss reserve laws of Massachusetts and New York. As a result, it is now possible to secure accurate estimates of the average cost of accidents and suits. The experience of nine companies for 10 years ending 1 Oct 1908 that formed the basis for the reserves required for the year 1908 is computed upon premiums of \$103,544,506. The number of persons reported injured by these companies was 1,952,731. The amount paid on account of such injuries was \$44,921,435. The suits settled were 45,249 costing \$21,746,488. In 1908, the premiums for liability insurance amounted to \$21,704,792. This embraced the business of 17 companies against which the reserve for 6,193 suits pending on account of accident was \$3,266,741, and the reserve for 541,726 injuries which should be distributed among the consumers like any other manufacturing cost was therefore \$525.98, and the average cost per injury \$27.64. There were 5,411 suits pending in 1906, upon which a reserve was required; 5,811 in 1907, and 6,193 at the end of 1908. The premiums received dur-

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ing 1906 were \$19,358,447; for 1907, \$22,759,060, and for 1908, \$21,704,792.

In 1909, legislation was enacted for standard provisions for accident policies and accident and sickness insurance. Minnesota led the way, and New York, Massachusetts, and Ohio followed. Under the New York law as first proposed, the rulings of the Superintendent of Insurance were not receivable by the Courts. This was changed, however, just before the measure passed both houses. There was much opposition on the part of leading companies to a standard policy or to standard provisions in the policy. The International Association of Accident Underwriters and the Board of Casualty and Survey Underwriters took vigorous action during the year 1908 to counteract the sentiment of the Insurance Commissioners favorable to standard provisions. The premiums written in 1909 were \$24,794,108, and the losses paid amounted to \$9,909,379. The rates of loss was 44 per cent. For 10 years ending 31 Dec. 1908, the premiums received for accident insurance were \$139,749,486, and the losses paid, \$59,065,967. During the same period, the premiums for health insurance were \$18,079,586, and the losses, \$7,288,836. In 1908, there was a substantial increase in accident premiums over 1907, being \$22,322,423 as against \$18,865,102. For 1908, the health premiums showed a loss as compared with 1907, the figures being \$3,638,007 against \$3,872,936. That year the payment of weekly indemnity was limited at first to 26 weeks, and afterwards was extended to 52. Later on, it was raised to 104, and finally to 200 weeks. It is now practically without limit through a provision that such payment will be made so long as the assured lives and is totally disabled. Striking features of many policies are accumulations on weekly indemnity, payment of hospital expenses, and payment of weekly indemnity to the beneficiary.

There was proposed at the annual convention of the International Association of Accident Underwriters in July 1909, the formation of "The Bureau of Publicity" to have charge of matters of legislation, departmental relations, and publicity for casualty insurance companies. The membership is to be open to all companies engaged in Casualty Insurance in the United States. The Bureau is to consist of a manager in charge, a governing committee composed of the manager and the representatives of six casualty companies, two to be selected by the executive committee of the International Association of Accident Underwriters, and two by the executive committee of the Board of Casualty and Surety Underwriters, and two by the Detroit Conference and other companies that become subscribers to the bureau. It is expected that bureau will begin operations 1 Jan. 1911. This new bureau is evidence of the tendency of the companies towards cooperation along reasonable lines. It is said that the first accident insurance transaction in America was between the President of the Traveller's Insurance Company of Hartford and a resident of that city whereby in consideration of a premium of two cents, the company agreed to be liable for \$5,000 in case of accident to the assured while going from the postoffice to his home. The company issued the first policy shortly after. It agreed in consideration of \$2 to protect the insured against loss of life or personal injury while travelling from Hartford to

Washington and return. An accident policy originally was a contract of insurance against loss of life, limbs, or total disability because of bodily injuries. The full amount was payable in case of death or loss of hands, of feet or eyes. The manner in which these policies expanded has already been set forth.

Plate Glass.—The net premiums written for plate glass insurance in 1909 amounted to \$3,381,766 with losses of \$1,103,801 or a loss ratio of 34 per cent. There was no material change made in the form of the policy during the year and the present policy is substantially the same as has been used by the leading companies for many years. In 1908, the premiums for the first time in the history of the business exceeded \$3,000,000, the exact figure being \$3,184,467. Losses that year were \$1,258,934 making a loss ratio of 39.5 per cent. The stock companies in 1907 had a premium income of \$2,799,746. Their losses were \$1,170,484. There was a general rise in price of plate glass during 1909, but the keen competition between the older companies as well as the activities of newly organized ones prevented the advance in rates from keeping pace with the increased cost of the glass. There was some controversy over the rates in Massachusetts, Rhode Island, Minnesota and Oregon, and in St. Louis, Kansas City and New York, but they were upheld. The first American company to insure plate glass was organized in New Jersey in 1868. A New York company was organized eight years later. No headway was made in the business until then. While there has been a steady increase in the number of companies and volume of business since that time, the policy contract remains practically the same. It covers loss or damage to the glass insured, which is broken by accident, due to causes beyond the control of the assured. This insurance for years applied only to plate glass. There are policies now that cover bevelled, mitred, leaded, cathedral, chipped, bent, florentine, jeweled, ribbed, and wired glass. The total premiums received by these companies up to 31 Dec. 1906 amounted to \$18,582,607, and their losses, \$7,128,204, or a loss ratio of 38.4 per cent.

Steam Boiler.—During 1909, the total premiums received for boiler insurance amounted to \$2,250,160. There were losses of \$200,055, making the loss ratio of 9.1 per cent. There was an increase of \$207,711 in premiums over 1908. In 1908, the boiler premiums amounted to \$1,958,449, while in 1907, they were \$2,062,289. Much of this decrease was due to the general business depression which also affected other insurance companies. A most important form of boiler insurance is against loss of profits and income through the total or partial destruction of a plant caused by boiler explosion. In 1909, the Massachusetts insurance commissioner decided that this form of policy was not authorized by the laws of the State and ordered the companies to cease writing it. The legislature however legalized it in 1910. Experts estimate that every year there are between 1,300 and 1,400 boiler accidents in the United States. Of this number, between 300 and 400 are explosions of a serious nature and these accidents as a rule result in injuries or death to between 400 and 500 people. The average property loss involves half a million dollars. In 20 years, since boiler insurance has been written, 7,000 boiler explosions have been

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recorded in which over 6,000 persons were killed, and more than 10,000 injured. The main change in the policy contract, exclusive of the provision already mentioned, has been its extension to cover the main steam pipe from the boiler up to and including the cylinder of the engine.

Fly-Wheel—There were six companies issuing this kind of policy in 1909. The premiums received by them during the year amounted to \$124,773. Of this sum, one company received \$86,000, or twice as much as all the companies combined. The losses paid were \$13,779, or a ratio of only 11 per cent. During the year 1908 the premiums received were \$105,546, and the losses paid \$35,181.

The premium is based upon the number, kind, and diameter of the fly-wheels and the amount of insurance applicable to one loss. Experts claim that about 30 per cent more of the fly-wheels in use explode than the boilers, and that the loss ratio is considerably higher than that of boiler insurance. Fly-wheel policies may be extended to cover loss of profits and income due to explosion or bursting of wheels the same as in boiler policies. It also covers loss or damage to the property of the assured or to the property of others, also loss of life or personal injury caused by the collapse, bursting or breaking of fly-wheels. This policy was written by a single company for a number of years. But in 1907, rivals entered the field and there were four that year.

Burglary and Theft—The premiums written in 1909 amounted to \$2,734,004, and the losses paid \$889,904. The loss ratio was 33 per cent. In 1908, the premiums were \$2,485,890. This was an increase of \$200,000 over 1907. The losses on the other hand amounted to \$899,221. It made the loss ratio for the year 36.2 per cent as against 34.2 per cent the average for five years. The policy covers direct loss by burglary of any property mentioned in the schedule and abstracted from the house, building, or apartments or rooms occupied by the assured by any persons or persons making forcible or felonious entry into the premises. Uniform rates were established on bank burglary in 1909, but later abandoned.

Sprinkler Leakage—Covers loss or damage resulting from the accidental discharge or leakage of water from the Sprinkler system from any cause, except by fire, blasting or explosion, collapse of building or riot, war, etc. There were only three companies writing this policy in 1909. The total premiums received amounted to \$213,015, the losses and expenses paid, \$52,222, and the loss ratio 24.5 per cent. In 1908, the premiums received amounted to \$184,952, and the losses \$48,200, or a ratio of 26.1 per cent. The total premiums received for 10 years ending 31 Dec 1908 amounted to \$946,783, with losses of \$256,553. Many casualty companies have not entered the field owing to the competition of fire insurance companies having marine charters. This accounts for the unusually small number of companies now doing the business.

Fidelity and Surety—For 1909, the premiums were \$15,497,251, and the losses paid, \$4,219,824, a loss ratio of 27.3 per cent. The ratio of net underwriting profit to premiums earned from 1903 to 1909 by 15 of the leading companies writing this form of insurance was 1.8 per cent. The ratio of net losses incurred

to the premiums earned was 35.9 per cent and the expense 62.3 per cent. In 1908, the premiums amounted to \$12,530,922, losses, \$3,826,427. This was a loss ratio of 30.5 per cent as against an average of 33.4 per cent for the past five years. During 1908, the government of the United States refused to accept the bond of any casualty company for more than 10 per cent of the capital and net surplus of the company. During 1909, the casualty policies were extended to include loss by forgery, the bonding of directors in suits by stockholders for neglect of duty, the guarantee of the professional competency of architects and certified public accountants. In Nebraska, the rates of the company are regulated by law. Massachusetts obligates all companies to assume the entire liability under the bond, except where a portion of the risk was re-insured with companies admitted in that State to write the class of risk re-insured.

Credit—Covers loss from uncollected accounts. This form of insurance is more or less of a special contract changed to meet each individual case. The assured must always assume a minimum amount of loss, which is deducted from the total losses before the company is liable. There is no fixed premium. In 1909, the premiums from credit insurance amounted to \$1,871,517, and the losses paid, \$1,767,272, or a loss ratio of 94.4 per cent. The premiums in 1908 were \$2,209,539, and the losses, \$1,884,620, or a ratio of 85.3 per cent. In 1907, the premiums were \$2,072,014; the losses paid, \$710,939, and the ratio, 34.3 per cent.

Automobile Property Damage—Against loss as result of a collision with any other automobile, vehicle or object. The insurance company is not to be liable for more than actual value of the property destroyed at the time of its destruction, plus the cost or expenses it may incur, in contesting the liability resulting from such collision or the actual cost of suitable repair of the property injured nor for a greater sum than the amount of insurance attaching to the offending automobile. In 1909, the premiums received amounted to \$801,221, and the losses paid, \$250,455, or a ratio of 31.2 per cent. The year before the premiums were \$233,369; the losses, \$51,831, and the ratio 29.2 per cent.

Insurance, Credit. See INSURANCE, CASUALTY.

Insurance, Fire. For the year ending 31 Dec. 1909, there were 272 mutual fire insurance companies in the United States. The year before they numbered 271, the same as in 1907. The joint-stock fire insurance companies were 132 in 1909, 131 in 1908, and 138 in 1907. In 1909, the capital of the joint-stock fire insurance companies was \$69,012,070, and the dividends \$9,850,069. The capital for 1908 was \$67,130,000 and the dividends \$8,845,310. For 1907 the capital was \$68,430,004, and the dividends \$7,996,245. The admitted cash assets for the mutual companies in 1909 were \$88,539,794; the net cash surplus, \$55,792,497; the net premiums, \$36,542,026; the total income, \$40,670,573. There was paid for losses that year, \$10,059,197; returned to policy holders, \$19,054,777; paid for expenses, \$7,102,272; total disbursements, \$36,216,246. In 1908, the admitted cash assets were \$81,851,829; net cash surplus, \$52,531,075; net premiums, \$34,108,173; total income, \$38,250,758. There was paid for losses that year \$10,880,593;

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returned to policy holders, \$17,808,367; paid for expenses, \$6,645,407; total disbursements, \$35,334,367. The net cash assets for 1907 were \$77,111,869; net cash surplus, \$17,200,000, net premiums, \$32,965,531; total income, \$37,325,931. There was paid for losses, \$10,271,211, returned to policy holders, \$16,223,261, paid for expenses, \$6,360,431, total disbursements, \$32,854,903.

The fire losses in the United States and Canada during the last 33 years has been stated to be \$4,712,537,525, or an average of \$142,804,000 per annum. These figures do not quite agree with those of the Year Book. From the latter source, the aggregate property loss in 1907 was \$215,084,709, and the insurance \$127,000,000. In 1908, the property loss was \$217,885,850, and the insurance loss \$157,000,000. The aggregate property loss in 1909 was \$188,705,150, and the insurance loss \$143,000,000.

The total property loss by fire in Greater New York during 1909 was \$10,153,881. This involved insurance amounting to \$193,592,240. The insurance loss however was only \$9,873,341. That year, the property loss in Chicago was \$4,824,010; insurance involved, \$37,315,713; insurance loss, \$4,507,789. In Philadelphia the property loss was \$2,173,848; the insurance involved, \$59,482,150; the insurance loss, \$2,152,041. The Greater New York property loss in 1908 was \$11,801,900, insurance involved, \$180,994,698, insurance loss, \$11,534,143. The property loss for Chicago that year was \$5,678,620; the insurance involved, \$41,777,054, insurance loss, \$5,678,620. In Philadelphia, the property loss was \$2,440,338; insurance involved, \$62,066,725; insurance loss, \$2,282,139. Of the fires in Philadelphia 81 per cent were confined to the buildings. The total insurance loss of Greater New York in 1907 was \$12,116,524; Chicago, \$5,170,033. The property loss in Philadelphia was \$2,093,522; insurance involved, \$61,132,775 and insurance loss, \$1,871,018.

The outstanding risk for 163 United States and foreign companies combined was as follows: For 1909, amount covered \$1,711,301,958; for 1908, \$1,530,038,298; for 1907, \$1,403,467,406. The premium rate was 1.2161 on \$100 for 1907, 1.1967 for 1908, and 1.2229 for 1909.

New Jersey, Massachusetts, and Connecticut have extended the charter rights of fire insurance companies to the end that they may also do an ocean marine business. This legislation was enacted because of a general idea that modern commerce requires insurance writings to cover all risks whether of fire or otherwise, from the point of shipment to that of delivery. There is agitation in some of the Middle Western and Southern States which suggests that ultimately people will demand supervision of rates charged by fire insurance companies. The difference in the quality of risks even in limited territories, to say nothing of the well known difference in fire protection from city to city, would seem to require that the making of rates should for a time at least be in the hands of an organization with especially equipped facilities for ascertaining the particular hazard of individual risks in such localities.

During the last few years, the high pressure system has been introduced in the borough of Brooklyn and the lower part of Manhattan. A central pumping station has been established and independent high-pressure mains and hydrants. The fire department is also using at present a powerful gasoline auto hose wagon.

San Francisco has started to install a similar system. The subject of adequate fire protection has also been under consideration in Chicago and the high pressure method of New York was mentioned in a report by a local official. It will probably be adopted there also.

During the year 1910, Texas established a State board for the making of rates. The law creating it has since been revised by the legislature, owing to the general dissatisfaction over some of its provisions. A commission in Illinois has been investigating the fire insurance business and it is believed that the report this body will submit to the legislature will recommend strong anti-rebate laws. No attempt at the supervision of the rates will be made. A similar body in New York began investigating the insurance business in the latter part of 1910.

Insurance, Fly-Wheel. See **INSURANCE, CASUALTY.**

Insurance, Fraternal. See **FRATERNAL ORDERS.**

Insurance, Legislation. See **INSURANCE.**

Insurance, Liability. See **INSURANCE CASUALTY.**

Insurance, Life. There were over 200 active level premium American life insurance companies that reported for the year 1909. The figures here relate to two classes, viz., the ordinary and the industrial. During the year, 173 of the ordinary companies issued 733,084 policies involving \$1,332,873,589 insurance and the 16 industrial, 5,560,580 for \$1,116,242,136. The combined companies had 28,087,327 policies for \$15,480,721,211 outstanding at the time. The admitted assets of these companies was \$3,643,857,971, and their liabilities, exclusive of capital stock, \$3,103,074,297. The income of the ordinary companies was from premiums and annuities, \$406,776,837; interest and other \$156,336,524, making a total of \$563,113,361. For the industrials, the premiums and annuities amounted to \$158,452,056; interest and other, \$20,462,479; total, \$184,914,531. The disbursements of the ordinary companies were \$391,706,287, and for the industrials, \$113,654,196.

In 1908, the number of active level premium American life insurance companies making report was 180. There were 16 that transacted business before the days of State supervision and as a consequence no public record was kept of their transactions. The ordinary insurance written during 1908 was \$1,523,121,398, and the industrial, \$550,044,576. The losses incurred were \$134,069,493 for the ordinary, and \$29,667,825 for the industrial. The ordinary insurance in force on 31 Dec. 1908 was \$10,484,953,637, and the industrial, \$2,593,625,860. The ordinary insurance written in New York State that year was \$196,122,340, and the industrial, \$110,191,927. Pennsylvania was second with \$155,739,756 ordinary and \$79,982,334 industrial. The admitted assets of 156 ordinary and 14 industrial companies in December 1908 was \$3,380,294,090. The liabilities exclusive of capital for both amounted to \$2,895,683,950. Some figures on the subject are: Capital and unassigned funds, 1 Jan. 1909, \$251,431,616; premiums received, \$545,849,752; payment to policy holders, \$336,909,834. New business paid for in 1908, including revivals, ordinary companies, \$1,481,930,726; industrial, \$605,073,906.

There were 170 active level premium American life insurance companies in 1907. The

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insurance in force on 1 Jan. 1908 was \$11,486,115,758 ordinary and \$2,577,246,881 industrial. Of the companies reporting, 22 were industrial. The premium and annuity for 146 ordinary and 14 industrial companies was \$553,077,447, interest and other, \$145,579,148. There was paid to policy holders, \$309,696,977; expenses, \$129,090,434; number of new policies, 4,903,966, and their amount \$1,921,390,872. There was \$14,062,408,755 outstanding insurance. The assets of 146 ordinary and the 14 industrial companies was \$3,052,732,353; their liabilities, \$2,709,686,372. The surplus was \$343,045,982.

The New York statutes regulating life insurance companies are of more than ordinary import owing to the influence exerted upon them by the famous legislative investigating committee of 1905.

Annual statements must be filed 1 March. Expiration of license, 31 December. No premium upon any policy issued on or after 1 Jan. 1907 shall be charged for term insurance for one year higher in amount than the premiums for term insurance for one year at the same age under any other form of policy issued by the corporation. Policies are incontestable after two years, except for non-payment of premiums and violations of conditions of policy relating to military or naval service. No policy or endowment insurance shall be issued or delivered in the State unless it contains in substance, 10 standard provisions. Foreign companies must have \$100,000 on deposit with proper financial officer in home State, and file certificate of such deposit with Superintendent of Insurance. The assets must be at least \$100,000, invested in United States bonds or securities of the home State, county, or incorporated city, or in bond and mortgage on improved unencumbered property worth 50 per cent more than the loan. The limit of capital impairment is 50 per cent. Annual distribution of surplus on policies provided for. Taxes, 1 per cent on gross premium. Where home State charges in excess, the company must pay to the insurance department the difference between the 1 per cent and the excess tax of the home State. Legal minimum valuation of contracts after 1 Jan. 1907 is fixed in accordance with select and ultimate methods with the following allowances for mortality in the first five years in the issuance of the contract. First year, 50 per cent of the rate shown by the American Experience Table of Mortality; second year, 65 per cent; third year, 75 per cent; fourth year, 85 per cent; and 5th year, 95 per cent. No policy is valued as term insurance unless premium is based upon net term rates and no policy with level premium valued as term insurance for the first policy year.

The final date for filing annual statement in Pennsylvania is 1 March. Licenses expire, 31 March. The examinations of the companies rest in the discretion of the Insurance Commissioner. Capital required is \$300,000. The assets must be equal liabilities. Gain and loss exhibit to be in annual statement. The limit of impairment of capital is 20 per cent. Taxes, 2 per cent on gross premium. No other State tax. Companies subject to local taxes. Valuation basis: Actuaries Experience Table of Mortality with interest at 4 per cent to 1 Jan. 1903, thereafter the American Experience Table of Mortality with interest at 3½ per cent. Anti-discrimination law.

In Massachusetts it is provided that when assets are shown in advertisements, liabilities must also be shown with equal conspicuousness. Final date for filing annual statement is 15 January, but may be extended to 1 March on request. Anti-discrimination law. Color discrimination also prohibited. Board and special contracts, stock selling prohibited. Company license expires 30 June. No provision for deposit. Capital required, \$100,000. Gain and loss shown in annual statement. Authority to do business may be suspended when insurance commissioner is of opinion that actual funds, exclusive of capital, are less than liabilities. Incontestability after two years. Tax on premiums regulated by reciprocal provision. Tax of ¼ of 1 per cent on reserve. Basis of valuation: policies prior to 1 Jan. 1901, 4 per cent. Actuaries or Combined Experience Table; policies after 31 Dec. 1899, 3½ per cent American Table.

Final date for filing annual statement in New Jersey is 31 January. No distinction or discrimination in favor of individuals between the insured of the same class and equal expectation of life in premium or rates or dividends or other terms of policy. Deposit governed by reciprocal provisions. Capital required, \$100,000 or net assets of that amount. Authority to do business may be revoked if the assets in excess of the liabilities, exclusive of capital, are less than \$100,000, the minimum capital required, or if commissioner deems company unsound. Policies incontestable after two years, except for non-payment of premium and violation of conditions as to hazardous travel, residence or occupation. Valuation basis: Actuaries Table of Mortality with interest at 4 per cent on policies issued prior to 1 Jan. 1901; and American Experience Table of Mortality with 3½ per cent interest on policies issued after 31 Dec. 1900; policies issued after 1 Jan. 1907, "modified net reserve plan."

Final date for filing annual statement in Minnesota 15 February, but may be extended to 1 March. Anti-discrimination law. Board and special contracts and stock selling prohibited. Expiration of company license, 28 February. Deposit: certificate from official in home State showing that company has on deposit, for benefit of its policy holders, securities to amount of \$100,000, or depositing them with Insurance Commissioner. Must possess available assets to amount of \$100,000. License may be suspended whenever assets insufficient. Incontestability after two years. Non-forfeiture after five years. Face of policy to give brief description in bold type. Established standard forms of policy. One year preliminary term insurance. Surplus distribution, annually after three years. On deferred dividend policies heretofore issued, surplus shall be ascertained annually and credited by classes. Valuation basis: American Experience Table of Mortality with interest at 4 per cent.

Annual statement in Illinois must be filed 1 March. Board and special contracts and stock selling prohibited. License expires 28 February. Deposit required \$100,000 with insurance department, or with official in home State. May include in deposit, certificates of deposit issued by any bank or trust company, or certificates of purchase acquired by foreclosure. Company to possess \$100,000 actual assets. When funds of company not equal to the net value of its

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policies, company must cease writing business until impairment is made good. Incontestability after two years. Non-forfeiture after three years. Law provides for modified preliminary term insurance based on 20-payment life rate. If payment of dividends deferred later than the third policy year, such companies shall furnish the Superintendent each year a detailed statement covering such deferred dividend policies. Valuation, annually on a net premium basis. For contracts issued prior to 1 Jan 1908, Actuaries Combined Experience Table with 4 per cent interest; subsequent contracts, American Experience Table with $3\frac{1}{2}$ per cent interest.

Under the laws of Wisconsin, no corporation or stock company can act as agent. Annual statement must be filed 1 March. May be extended 60 days on request. Anti-Discrimination law. No Board and Special Contracts and stock selling. Annual license fee, \$30. Expires 28 February, may be extended to 1 May. Company to have \$100,000 cash capital. No new policies to be issued when assets do not equal liabilities. No provision as to incontestability. Any stock life company with \$100,000 capital may write accident and health insurance. Participating and non-participating policies not to be issued by the same company. Companies doing business on participating plan must determine and report the respective rights of policy-holders and stock-holders in unassignable surplus before being licensed. Surplus distribution annually on policies hereafter issued unless otherwise provided in policy. On policies heretofore issued annually, an annual statement sent to policy-holders. Valuation basis: American Experience Table of Mortality, with interest at $4\frac{1}{2}$ per cent, valuations to be made annually.

Annual statement in Missouri must be filed 1 March. Anti-discrimination law. Board and special contracts and stock selling prohibited. License expires 28 February. Deposit required, \$100,000. Additional deposit to cover registered policies. Capital required, \$100,000. Impairment of capital treated at the discretion of the Superintendent of Insurance. Incontestability after three annual premiums have been paid. Suicide not a valid defence against payment of loss unless contemplated when policy was taken out. Non-forfeiture after three years. Taxes, 2 per cent on gross premiums. Valuation basis: Actuaries Table with 4 per cent interest.

Annual statement in Connecticut must be filed 1 March. Anti-discrimination law. Deposit-Reciprocal law. Assets must be in excess of liabilities. Gain and loss exhibit incorporated in annual statement, but not published. Impairment of capital, no provision; law applies to domestic companies. No provision as to incontestability. Reciprocal law. No provision as to surplus distribution. Taxes governed by reciprocal law. No local taxation. Valuation: For contracts issued prior to 1901, the Actuaries or Combined Experience Table with 4 per cent interest; subsequent contracts, American Experience Table with $3\frac{1}{2}$ per cent interest.

Insurance, Marine. In 1909, there was a strong demand in New York for an amendment to the law that would permit Ocean Marine Companies to insure against any of the risks, including, of course, fire, transportation, navigation, on land, inland waters, and sea. There was no change in the ocean marine

field either by admissions, withdrawals, incorporations, liquidations, or increases or decreases of capital. For the year ending 31 Dec 1909, there were 632 Fire and Marine Insurance Companies in the United States. Their capital was \$87,504,299, assets exclusive of premium notes, \$667,605,008, net surplus, \$244,061,628; net premium, \$333,372,197, and their total income, \$366,751,426. The losses paid that year amounted to \$156,038,616, the dividends, \$31,180,846; the expenses, \$116,756,266, and total disbursements, \$303,975,730. In 1908, there were 636 companies and Lloyds with a capital of \$84,704,959. Their total income was \$339,068,915, losses for the year, \$167,351,750; disbursements, \$307,223,933. The companies and Lloyds numbered 654 in 1907, with an income of \$342,531,049, and disbursements of \$282,065,025.

Insurance, Plate Glass. See INSURANCE, CASUALTY.

Insurance, Sprinkler. See INSURANCE, CASUALTY.

Insurance, Steam Boilers. See INSURANCE, CASUALTY.

Insurance, Surety. See INSURANCE, CASUALTY.

Insurgent Movement. When the first small group of Republican statesmen in the House of Representatives rebelled from the power of the Committee on Rules and Speaker Cannon, it appeared at first to be a factional fight and was so regarded even by many Republican Congressmen after the Insurgents obtained the upper hand. It had by that time become known, however, that the Insurgents had secured a large following, and had behind them their congressional districts. Instead of being individuals, breaking from their party, they were the head of a movement which had been forcing recognition for a number of years. They represented the reform movement and urged their more conservative fellow congressmen to adopt their ways.

For a number of months towards the end of 1909 the strength of the Insurgents was directed towards the Speaker's power, and came to a head when the Insurgents, joining with the Democrats, refused to permit the Speaker to control the naming of the House members who were to sit in the Ballinger-Pinchot controversy. It was not until March 1910, however, that his reign came to an end when he lost control over the Committee on Rules, which had ruled the House for many years. This was, in fact, the most significant act in the rise of Insurgency. It led to a bitter fight, which was carried by the conservatives into the territories which were strongly insurgent. The primary elections during the summer showed, however, that the tide could not be stemmed. All that prevented the Insurgent wing of the Republican Party from ruling Congress was the victory of the Democrats at the November elections.

The Insurgent victory was attended with considerable political bitterness, but gave rise to a new set of statesmen who showed themselves remarkably successful on the floor of congress. It was there that the chief battles were fought, and it was due to their personal power that they were able to dislodge an entrenched majority with a small minority.

INSURGENT MOVEMENT—INTERSTATE COMMERCE COMMISSION

It has since become apparent that the Insurgent movement affects a large proportion of the population, and is a natural breaking from old standards which had already in effect been abandoned by those who were in the Insurgent movement. It was the climax to a series of governmental changes. The leaders of the Insurgents have always held that their movement was fundamental and would have been directed against any party that might have been in power. If the Democratic party continues to acquire strength, it is freely predicted that the movement will take form in that party as well.

Insurgency, as regarded by its supporters, has its inception in the earliest of the modern reforms, beginning with the secret ballot. This also included corrupt practices' acts and the overthrowing of the existent bosses. In a little later period, dated generally as about 1900, it began to take form in the demand for a direct primary and is now urging direct legislation, the recall, and in some instances the election of senators by direct vote.

The movement began to take on its more recent aspect when 32 States passed direct primary laws, which led to the general overthrow of the bosses. This was followed immediately by the demand for direct legislation, in some cases secured through the initiative and referendum in others acquired without its assistance. Direct legislation, at the close of 1910, was recognized in one form or another in Maine, Missouri, Michigan, Arkansas, Oklahoma, South Dakota, Nevada, Oregon, and Montana. In all of these States the initiative and referendum have become part of the State constitution.

In addition, Texas has a modified form of direct legislation permitting the people to vote on all subjects included in the party platforms at the primaries. The initiative and referendum was pledged by every party in 1910, in Nebraska, Wisconsin, Illinois, Colorado, California, North Dakota, Kansas, and Massachusetts. It will also probably be adopted in Arizona, Idaho, Wyoming, Washington, Utah, Minnesota, Iowa, and Ohio. Indiana and West Virginia are the only Northern States west of the Alleghenies which neither have nor are about to have direct legislation. The recall, to be exerted against officials who prove to be undesirable, has been slower in gaining headway, but is regarded as portion of the Insurgency platform.

The Insurgent Republicans maintained their intention of remaining within the party and bringing it to their point of view, in spite of numerous efforts to rule them out of the party.

Some of the most vigorous political struggles in recent history occurred over the November elections. Ex-President Roosevelt helped the Insurgents to fight their battles and his immediate followers took the same stand. One of the most notable victories was that of Hiram Johnson, for the governorship of California, who won the election on the single issue of compelling the Southern Pacific Railroad to retire from politics. In no other State had a single interest been so thoroughly entrenched. Johnson not only carried the State of California, but had the largest plurality in San Francisco, which a year previously had voted against the continuance of the graft prosecution.

As to the effect of the insurgent victory upon the leadership of the Republican party nothing was settled. President Taft remained its active head, and showed a disposition to treat the newly elected Insurgent members of congress on the same basis as the conservative Republicans. In a number of instances, notably New York and Indiana, the split in the Republican party caused by the Insurgent movement resulted in the election of Democrats and, on that account, the Insurgent movement as related to the Republican party did not win so sweeping a victory as might otherwise have been the case. A large part of the Democratic party having already expressed itself in favor of many of the governmental changes demanded by the Insurgents, it remains an open question whether so wide a schism will be made in the Democratic party. In some respects, however, there are marked differences in point of view between the Democrats and Insurgents. Whether this will lead to a joining of forces on the part of Insurgent Republicans and Democrats is one of the chief political problems which will be solved before the end of the next congress. See also PROGRESSIVE REPUBLICANS.

Internal Revenue. See U. S. INTERNAL REVENUE.

International Bureau of American Republics. See PAN AMERICAN UNION.

International Crop-Reporting Service. See CROP-REPORTING SERVICE, INTERNATIONAL.

International Humane Conference. See HUMANE CONFERENCE, INTERNATIONAL.

Interstate Commerce Act. An Act passed by the Congress of the United States and signed by President Cleveland, 4 Feb. 1887. It was extensively amended in 1889, 1891, 1895, 1903, and 1906. It statutes apply to all common carriers engaged in carrying passengers or property by rail, or by rail and water, and in transporting oil by pipe lines, beyond the limits of one State or Territory into others. Its provisions are enforced by the Interstate Commerce Commission (q.v.) which it created. The main object of the law was to prevent carriers from exercising unjust discrimination, or undue or unreasonable preference towards passengers and shippers. This matter was further developed in the light of experience obtained through enforcement of the act, and the enacting of 11 Feb. 1903, commonly known as the "Elkins Act," penalized the offering, soliciting or receiving rebates and allowed proceedings in the courts by injunction to prevent departures from published rates. All rates and charges must be filed and published, and failure to comply with this results in prohibition to engage in interstate commerce. The act contains regulations compelling automatic couplers and other safety appliances. It also provides for full reports to the commission of all accidents; regulates hours of employment, and directs efforts at mediation and conciliation in cases of dispute between employers and employees.

Interstate Commerce Commission, The. A body created by the Interstate Commerce Act (q.v.) for the enforcement of its provisions. At present it is composed of seven members, appointed by the President, with the consent of the Senate, for a term of six years.

INVAR — INVENTIONS

The salary of each commissioner is \$10,000 per annum, and there is a secretary who receives \$5,000. This commission has power to inquire into the management of all common carriers and to prevent infractions of the Interstate Commerce law. It also determines and prescribes reasonable rates, regulations, and practices and orders reparation to injured shippers. Its work is of an extensive character. During 1909 it decided nearly 600 cases instituted by formal complaint, and over 1,000 additional proceedings were undertaken. Some 35 criminal indictments were obtained, 42 prosecutions were brought to an end, and \$304,233 collected in fines. Some of the decisions rendered were of far reaching importance. Several great railway systems, by refusing to make reasonable joint arrangements with other lines, had endeavored to obtain a monopoly of freight and passenger traffic in their territory. This was judged to be an unlawful course of procedure, and the offending companies were compelled, in the interest of the public, to arrange for reasonable joint rates. The commission is also constantly occupied with efforts to reduce the enormous yearly loss of life at grade crossings, etc. The commissioners devote their whole time to the work, the law forbidding them to engage in any other occupation.

Invar. Invar is an alloy of the two metals, nickel and steel, and, from a scientific standpoint, is far more valuable than diamonds, though its market price is much lower. It was discovered fifteen years ago by C. E. Guillaume, a French scientist, and, after having been subjected to the severest sort of tests in laboratories, has been proved to have an expansion so small as to be insensible throughout any natural range of air temperature. The time and energy wasted for centuries in stopping to compute expansion and contraction, changes in lengths, widths, thicknesses, diameters, and volumes of all scientific measuring instruments of precision has ever been very great in the work of physicists, electricians, and chemists. Invar will now do away with all this. Seemingly impossible achievements have already been wrought with this composition, which has now come to be the world's standard invariant. The exact combining qualities of steel and nickel were employed in making pendulums for the great standard sidereal time clocks for observatories. Formerly every conceivable kind of metal and wood, with their compounds, had been tried for this purpose, but the clocks would always gain or lose time, even when the pendulum was made to swing in a case from which all air possible had been removed, and in rooms kept at one invariable temperature, in so far as that is within the power of physicists to maintain. The invar pendulum, with its high degree of accuracy of one in 500,000 eliminates this variation. Scientists will now devote themselves to ascertaining whether or not the day is changing in length. At present it is not known whether the day is shorter or longer than it was centuries ago. The tides create the length of the day. With the new invar pendulums all clocks heretofore used appear like clumsy machines, set, as they are, on faint stars which have no appreciable proper motion. This invar pendulum will inevitably reveal the fact if the day is lengthening by so much as the fraction of a second a year.

Inventions, Office. Perhaps no department of invention has been exploited more than that relating to labor-saving devices in general office equipment. The general routine of large offices handling a great volume of business with monotonous yet exacting details has been a rich field for prolific invention. Take, for instance, the folding machine, which folds papers, circulars, and letters with as much care and more certainty than the ordinary office boy. It snatches the sheets one by one and passes each through a net of devices to make the successive folds. Its method suggests that of hand work. The sheets are centered preparatory to folding, and stacked in a neat pile. It is more dexterous than the hand in the continuous motion of the sheets from one set of folding rolls to another, and in the celerity and accuracy of the work in contrast to the manual method of shifting the sheet between the hands and creasing it down in each fold. A small motor-driven machine can fold 6,000 to 8,000 sheets per hour, at a cost of 2 cents per thousand compared with 26 cents per thousand by hand labor. In conjunction with the folder naturally comes the mailing machine, used by the larger firms, which handle great quantities of mail. This device is motor-driven and mechanically moistens stamp and envelope flap, and affords pressure necessary to make them adhere. A convenient *hand sealer* consists of a metal tool having a small well of water in the handle communicating with a felt or sponge moistener at the end, the back being a smooth curved surface. Both sealing and stamp affixing becomes a simple matter with the aid of this implement. A more elaborate hand machine has a receptacle for a strip of stamps, which are fed over the moistener one at a time by the fingers of the operator. Homogeneous with these is the stamp *fixer* resembling a dating stamp. Envelopes are inserted in the machine one by one, the handle being depressed for each, the stamp moistened and affixed and the letter counted simultaneously. This machine holds a large number of stamps, but its registering device prevents pilfering and misuse. With the rotary sealer the operator turns the crank with his right hand, and with the left hand holds a pack of letters, flaps all one way which he hooks to a slide. The machine picks up each envelope, passes it over moistening rollers, turns over its flap, and passes it through sealing rollers which, in turn, eject it into a basket. Envelopes of all sizes may be handled at the rate of 6,000 per hour. There are combination mailing machines which not only affix stamps and seal flaps, but also deliver the prepared mail packed in bags ready for the postoffice. In a machine of this type a quantity of unstamped envelopes are placed in a tray from which they are taken in handfuls and held against an automatic feed which snatches off one envelope at a time and passes its flap over a metal moistening disk. Simultaneously a strip of stamp is passing forward and at the proper moment one is detached, moistened, and affixed. The flap is then laid down, and the envelope passed between the rollers, automatically counted and stacked.

The automatic cashier and change-making machines, are used by concerns handling large amounts of fractional currency, operates with greater speed in making change than is possible

INVENTIONS — IOWA

by hand. The machines have a keyboard of numbered keys and a receptacle for coins of different denominations. Depressing a key shoves the bottom coin of one of the piles out from its fellows to make up the amount totalled by the keys depressed. One form of machine each transaction is completed by the depressing of a single key without requiring mental calculation. There are "payers" and "changers." In the former, depressing key 38, for example, causes mechanical figures back of the 25-cent piece, the dime and the cent trays to shove out the minimum number of coins—five in this instance—necessary to make up the amount, and the coins drop through a spout into the hand of the operator or a pay envelope. In the changer, depressing the same key, 38, causes coins amounting to the difference between 38 cents and a dollar (62 cents) to be separated from their respective piles and delivered through the spout.

In the case of adding or calculating machines the operator sits before the machine just as he would at a desk. The interaction of keys and levers perform an entire mental process for him. The keyset machine visualizes the result of the mechanical computation or a row of dial wheels, imprinting it on a paper strip. Most types of this machine are operated by the fingers of one hand manipulating the keyboard.

The signature machine enables an official to sign from 10 to 20 checks, stock certificates, or other documents at a time. The ro-signature machine consists of a dummy or "monitor" pen, which the signatory hold in his hand like an ordinary pen, but which is attached by a flexible joint to a light aluminum pantograph frame in the horizontal plane because supported on roller bearings. The monitor pen itself does no writing, but every motion imparted to it by the hand is followed by each of the ten fountain pens carried on the frame. In this manner an official can get through what would ordinarily be several days' work in a single hour. Using a 20-pen machine an official of the United States Steel Corporation was able to sign the entire dividend list—the largest in the world—at the rate of 5,000 checks an hour. As a test a record of 28 minutes 10 seconds was made in the case of one 5,000-batch of signatures.

The automatic typist for reproducing form letters by writing them individually letter for letter on a typewriter instead of printing them by any of the stencil or type-duplicating processes, is an actual automaton. This machine is placed over the keyboard of a typewriter, and operates it in the same way as a human operator would do; but with not only the greater speed that the employment of a machine gives, but with a gentleness and smoothness that compare favorably with the work of the average typist. The typewriter operator is worked by pneumatic mechanism, a small motor being the primary source of power and driving an air compressor, and the striking of the keys, spacing, and shifting being deftly and accurately effected by mechanical and pneumatic attachments. The control of this automaton is by a perforated "master sheet" of tough paper, which is required for each form letter to be written and which is made on a perforating machine separate from the typewriter operator

proper. This sheet is the guiding pattern for the body of the letter, and the addresses are taken care of in the same way by another perforated sheet, or roll. The perforating machine has a regular typewriter keyboard, but the depressing of each key, instead of printing a character punches a hole in the paper in a determined position on the sheet, somewhat on the principle of the music-roll of a self-playing piano. When the letter sheet and its accompanying roll of addresses have been slipped into place in the typewriter operator, and a quantity of letter-heads placed in position in a rack over the feed rolls of the typewriter, the turning of a lever starts the writing. The machine, operating the typewriter, abstracts the top sheet from the pack of letter-heads, rolls it into aligned position, writes the date, shifts the carriage back, and spaces down to write the address, and then proceeds with the body of the letter.

Many pencil sharpeners have been marketed, but only two really approach the manual operation of sharpening the pencil with a pocket-knife or other blade. A type of crank operated, geared machine is equipped with three revolving knives, which work on the pencil, taking off one shaving after another while the pencil itself is rotated slowly. Another device of more simple design weighing only eleven ounces, departs from the usual rotary process, the wood and lead being cut away by a reciprocating blade carried on a rocking arm and operated by simply pushing it downward.

A special impetus has been given to inventive genius by the many large American manufacturing companies through a system of promotions and prize awards to their bodies of employees. The National Cash Register Company, of Dayton, Ohio, for instance, received in one year 5,078 suggestions, of which 1,579 were adopted. No firm, no matter how important, can, under these conditions, pay a high price for all the ideas it adopts, yet that company pays about \$5,300 a year for ideas and suggestions.

Iowa. A State belonging to the West North Central Division of the United States with an area of 56,025 square miles, of which 550 square miles is water. The capital is Des Moines; population, 86,368. The population of the State in 1910 was 2,224,771. The decrease in 10 years has been 7,082, or 0.3 per cent. The population per square mile is 40.0. Iowa ranks 15th in population.

Agriculture.—Iowa is preeminently an agricultural State, nearly the whole area being arable and included in farms. In 1910 it had 34,574,337 acres of farm land, of which 29,897,552 acres were improved land. About half the farm area is devoted to the growing of cereals. In 1909 the crop of wheat was 7,446,000 bushels; oats 116,100,000 bushels; corn, 289,800,000 bushels; barley and rye, being also grown. The crop of potatoes amounted to 12,905,000 bushels; of hay, to 5,983,000 tons; of flaxseed to 294,000 bushels. In 1910 the State contained 1,447,000 horses, 1,570,000 milch cows, 3,611,000 other cattle, 754,000 sheep, and 6,485,000 swine. The wool clip yielded 5,100,000 pounds of wool, valued at \$1,444,440. Dairy farming and poultry-keeping are important.

Mining and Manufactures.—The productive coal-fields of the State have an area of about

IOWA—IRON AND STEEL

100,000 square miles, and are worked by 16,021 miners. The coal output in 1908 amounted to 7,161,310 short tons, valued at \$11,706,402. Lead and iron are found, but in no great quantity. Gypsum and ochre are worked and mineral waters are sold. Sandstone and limestone were produced to the value of \$533,282. The clay-working industries turned out bricks, tiles, and pottery to the value of \$4,060,497. The mineral output in 1908 was of the value of \$18,088,537. The output of manufactured goods in Iowa increased in value from \$132,870,865 in 1900 to \$160,572,313 in 1905. The chief industries with their capital are Slaughtering and meat-packing, \$7,297,359; butter, \$2,806,725; flour and grist products, \$5,216,059; lumber and planing mill products, \$13,258,861; cars, making and repairing, \$3,627,832; foundry and machine work, \$5,304,700; tobacco, \$1,598,764. Within the State in 1908 there were 9,911 miles of railway, besides 756 miles of electric railway track. The rivers also provide facilities for transport.

Government.—The Governor of Iowa is Beryl F. Carroll with a salary of \$5,000. The Lieutenant-Governor is George W. Clarke; Secretary of State, W. C. Hayward; Treasurer, W. W. Morrow; Auditor, J. L. Bleakly; Attorney-General, George Kosson; Superintendent of Education, A. M. Devoe; Adjutant-General, Guy E. Logan—all Republicans. The legislature consists of 158 members, of whom 50 are Senators and 108 Assemblymen.

Finance.—For the year ending 30 June 1910, the revenue and expenditure were: revenue, \$4,347,528; disbursements, \$4,149,803. The assessed value of taxable property in 1910, exclusive of railroad, telegraph and telephone property, was: real property, \$490,621,504; personal property, \$133,769,557; total \$624,391,061. This is 25 per cent of the actual value. The tax rate per \$1,000 is \$3.30. The State has no bonded debt.

Religion and Education.—The Iowa State Census Bureau publishes statistics of churches for 1905. The number of congregations reporting was 3,821. The returns, however, are incomplete and the numbers given below should all be increased by about 10 per cent. The sitting accommodation in places of worship was put at 1,155,648; the membership of the more important bodies is given as follows: Methodist-Episcopal, 147,899; Catholic, 143,639; Lutheran, 83,536; Presbyterian, 43,423; Christian, 37,443; Congregational, 33,739; Baptist, regular, 30,223; others, 4,974; United Brethren, 11,133; United Presbyterian, 8,442; Latter Day Saints, 7,544; Friends, orthodox, 6,950; other, 1,654; Episcopal, 6,831. Among the numerous bodies with smaller membership were the Salvation Army, Dunkards, and Christian Science. The average school attendance for the school year 1909 was 361,805. The number of female teachers was 2,801 and male teachers 25,006. The average monthly salary of male teachers was \$73.58, and of female \$44.50. The total expenditures for education in the State during the year 1909 was \$12,702,199. Three public normal schools had 107 teachers and 2,480 students in 1908, while six private normal schools had 52 teachers and 596 students. In the State there are 25 universities and colleges, the more important being the University of Iowa at Iowa City, 2,315 students; Drake University at Des Moines, 1,864 students; and Highland Park Col-

lege at Des Moines, 2,384 students. There is a State College of Agriculture and Mechanic Arts with 144 instructors and 2,347 students.

Charities and Corrections.—Besides almshouses and asylums for the insane, etc., Iowa has 41 hospitals (seven public, the rest private or ecclesiastical), 12 orphanages (one public), 24 homes (one public), two schools for the deaf and dumb (one public), besides two dispensaries and two day nurseries. The population of the eighteen principal State Institutions in 1908 was 8,369.

Legislation.—There was no legislative session in 1910. In 1909 measures were passed giving district courts power to deal with parents and children when the latter are neglected. Laws were enacted establishing the rule of comparative negligence in railroad cases, prohibiting drinking on railroad trains, limiting saloons to one for every thousand of population, regulating hotels, and prohibiting discrimination in the purchase of dairy and poultry products.

Events.—An important fact is the shrinking of Iowa's population. The decrease is attributed to the fact that the land is already fully occupied, causing a large migration into the Western States and Canada in search of cheaper lands. In 1910 Beryl F. Carroll was elected Governor, receiving 205,607 votes to his opponent's 187,163. Eleven representatives were also elected to Congress.

Ireland. See GREAT BRITAIN.

Irish Historical Society, American. The object of this society is, in part, "to investigate, especially, the immigration of the people of Ireland to this country, determine its numbers, examine the sources, learn the places of its settlement, and estimate its influence on contemporary events in war, legislation, religion, education" and "to endeavor to correct erroneous, distorted and false views of history" in relation to the Irish race in America. The society was organized in 1897 in Boston, Mass., and now has members in all the States and four foreign countries. At the 12th annual meeting at the Hotel Plaza, New York, in 1910, it was stated that several hundred new members had been enrolled in the preceding 12 months. During the year Volume IX of the Society's journal, containing among other papers a description of the contemporary accounts of Brendan's discovery of America, was issued. The president-general of the society in 1910 was Dr. F. J. Quinlan; vice-president-general, Hon. Thomas B. Fitzpatrick; secretary-general, Thomas Zanslauer Lee.

Iron and Steel. As a result of a congress held in 1910 at Stockholm regarding the future of the iron industry a tabulation has been prepared showing tentatively the supply of metallic iron upon which the world can depend in the future. The figures are based on estimates of the deposits of ore all over the world made by the geological surveys of various countries. The probable supply for the several great divisions of the earth is estimated as follows, the figures being for millions of tons:

	Known Supply	Probable Reserve
Europe.....	4,733	12,085
America.....	5,334	40,732
Australia.....	74	37
Asia.....	256	283
Africa.....	75	.....

IRON AND STEEL—IRRIGATION

Of course the figures for Asia and Africa are not intended as real approximations. They are at best guesses based on the present state of knowledge of those continents. Even assuming that both were relatively poor in iron as compared with Europe and America, there is no reason to think that the disparity would be as great as these figures indicate. Of course the estimates for the American continent taken as a whole are subject to sweeping revision as explorations, both geographical and mineralogical, progress, and it is not surprising to find that even the figures for some of the countries of Europe are vague, especially as to the "probable reserve." As given in the Stockholm computation, in millions of tons the amount of metallic iron that each of these can be expected to furnish is as follows:

	Known Supply	Probable Reserve
France	11,140	
Germany	1,270	Considerable
England	455	10,830
Luxemburg	90	
Spain	350	Considerable
Portugal .....	..	39
Italy	3	1
Switzerland	8	8
Austria	90	97
Hungary	13	34
Bosnia-Herzegovina .....	..	11
Bulgaria .....	..	0.7
Greece	13	
Turkey .....	..	Considerable
Russia	187	424
Finland .....	..	16
Sweden	740	105
Norway	124	525
Belgium	25	..

Taken altogether there is a known supply of at least 10,000,000,000 tons of metal. This would not carry the industry very far, since there is against it an annual consumption by manufacture of approximately 60,000,000 tons a year. The endurance of the supply, therefore, at the present rate would fall short of 170 years, even assuming that there were no increase. Increase, however, may be regarded as certain for many years to come. The story of the last century is given in the figures of the world's annual consumption at various characteristic periods: 1800, 800,000 tons; 1850, 4,800,000 tons; 1871, 12,900,000 tons; 1891, 20,200,000 tons; 1901, 41,600,000 tons; 1909, 60,000,000.

Should this galloping increase continue for even half a century more the supply of iron in sight would be practically absorbed and the consumption of what is now regarded as probable reserve would be well under way. This, as the total is now computed, is considerably more than five times as great in quantity as the visible supply. The question whether it would last five times as long depends entirely on the question, which no man can answer, whether the annual use will ever become a fixed quantity, or failing that, to what extent the annual increment of consumption will slow down.

At the worst there seems to be no room for fear that any one now living will see the end at hand of the supply of the one indispensable metal. The Stockholm computation appears to promise a sufficiency for at least a couple of hundred years at any rate of consumption now conceivable. Besides, there is room for hope that improved metallurgical methods will make it possible to utilize grades of ore that cannot

now be treated profitably. This has been the experience with gold, silver, and copper and indeed with iron too. But the most practical hope is the discovery of new mineral fields. From this point of view at least half of Asia and Africa and probably of South America may be regarded as virgin territory, and there are some indications that even the Antarctic continent may have vast quantities of ore under its casing of ice should humanity in 1,000 years or so be forced to turn hither in search of it.

According to Judge E. H. Gary, chairman of the Steel Trust, the iron ore production in the United States and Canada had increased from 7,000,000 tons in 1880 to 53,000,000 in 1909; pig iron from 4,000,000 tons to 26,500,000; steel from 1,250,000 tons to 25,000,000; coke from 3,500,000 tons to 41,000,000. At the ratio of increase he said there would be produced in 1930 of iron ore, 197,000,000 tons; of pig iron, 94,500,000 tons, of steel, 156,000,000 tons, of coke, 166,000,000 tons. See METALS.

Iron and Steel Institute. See IRON AND STEEL

Irrigation. Once a wilderness so unpromising that it evoked words of derision even in the halls of Congress, that portion of the States known as the "Arid West" is to-day universally recognized as the land of fortune and promise. The winning of the West is one of the most fascinating, romantic stories in all American history. It includes the trials and the hardships, the fortitude and the persistency, and the efficient and operative crystallization of all those manly qualities which we like to term typically American. The vast work of transforming a huge, arid, waste land into a territory rich beyond the wildest dreams of 50 years ago, has absorbed the big work of big men, the lives of forceful Americans; but in the last analysis this stupendous growth and advance must be attributed very largely to one agency. That agency is irrigation. Because of it, 13,000,000 acres are now annually producing harvests valued at more than \$350,000,000 and supporting in homes of their own more than 300,000 families. The wealth of this portion of the country, which prior to the Civil War was deemed valueless, is now greater than that of the entire nation was in 1860. In the swift march of national events during the past decade, the developing of the west has focussed the attention of the entire world. The irrigation movement records an epoch in our history overshadowing in far-reaching influence and importance any other progressive movement the United States has witnessed since the opening to settlement of the Mississippi Valley. The additional opportunities which have here been created for home-makers are already serving to check the undesirable efflux of the country people to the city. (See CONGESTION) Millions of acres of desert, unwashed by rain and storing in their bosom the fertility gathered for centuries of washings from hills and mountains, are being quickened by the life-giving waters which the irrigation movement have sent. As a result, cities, populous and great, have sprung up; rural communities, attractive and prosperous, broad vistas of fertile fields, and blossoming orchards whose yields are prolific beyond comparison, have replaced the wastes of sand and sage bush. Economic

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forces are to-day at work in this country shaping our agricultural development along new lines. Agriculture in the desert is intensive, and calls for and encourages a very high degree of intelligence. In many parts of the irrigated country agriculture now occupies a portion of greater dignity among the vocations than ever before, and agricultural people are yearly becoming more and more of a unit. The irrigation canal is the connecting link which thus binds counties together. This great public utility is controlled and operated for the common benefit. Cooperative management of the irrigation system is a fundamental in each of the government projects. The inevitable tendency of such management has been cooperative organization, which to-day is extended to all the farmers' activities—individual, educational, and social. See FARMERS' INSTITUTES.

The history of the irrigation movement itself is of comparatively recent origin. It may really be said to have had its beginning in the present extended form in 1898, when Congress appropriated \$10,000 "for the purpose of collecting from agricultural colleges, agricultural experiment stations, and other sources . . . valuable information and data on the subjects of irrigation . . ." This action was taken in response to a demand from the irrigated sections for help in a situation which had become very much involved.

The first people ever to practice irrigation in the United States were the Mormons who settled in Utah in 1847. During this time the Middle West was settling, and there was no great demand for irrigated lands. Development was normal, canals being built as they were needed and not far in advance of settlement. About 1880 attention was attracted to the success of irrigation in the arid region, and, led on by the great increase which irrigation had wrought in land values, capital rushed into this field and a great many canals were built far in advance of any actual demand for land. The corporations which constructed these banked upon securing profits through selling "water rights" to settlers. But they reckoned without the settlers. The latter stayed away, with the result that most of the large canals built by corporate interests were financial failures.

The building of so many canals, however, had its good effect. It proved beyond any question the inadequacy of the water laws of the Western States. Most of the States early recognized the right of appropriating or diverting water from streams for beneficial use, and also recognized that among appropriators the first in time was the first in right. On the other hand, they did not provide any means for determining the extent or date of appropriations, or any agency for protecting the original appropriator against later comers. Also, along many streams the capacity of the canals built exceeded the flow of the streams themselves. In theory, the beneficial use of the water diverted was essential to the establishment of a right. Since some of the canals were unused and almost none was used to its full capacity, there was great uncertainty as to what rights had been acquired, and this uncertainty could be removed only by appeals to the courts, which at the time had no well-defined principles and no technical knowledge upon which to act. Appeals

to the courts under such circumstances very often increased the confusion instead of creating order. This confusion regarding water rights was the dominant feature of the irrigation situation in the arid region at the time of the beginning of the irrigation work of the United States Department of Agriculture (q.v.), and it was the controlling influence in determining the nature of the work undertaken at that time. Before the work was actually begun, a conference of United States experiment station officers and irrigation engineers who had been prominently connected with the western irrigation development was held at Denver, Colorado. This was attended by experiment station officers from California, Colorado, Montana, Nebraska, Utah, and Wyoming, and by the State engineers of Colorado, Nebraska, and Wyoming, besides representatives from the United States Department of Agriculture. At this meeting the work to be undertaken was divided into two classes: (1) legal and economic, and (2) cultural, and Mr. Elwood Mead, at that time State engineer of Wyoming, was placed in direct charge of the movement. This action was approved by Congress at its next session, and the appropriation for the work was at the same time increased to \$35,000.

Early investigation of the laws and institutions relating to irrigation developed the weaknesses in the operation of existing laws which have already been mentioned. All of these weaknesses can be traced to a single source—the conception that water-right adjudications are private controversies in which the States have no more interest than in suits over any other kind of property. In adjudications, when matters did come before the courts, the public was not represented at all, and the decrees were always based upon interested testimony. In almost no case were the judgments based on any exact knowledge of the capacity of ditches, the quantities actually diverted, or the needs of the lands served.

At the time of the beginning of the irrigation work of the Department of Agriculture a type of irrigation company selling water-rights to farmers under contracts which, in effect, provided that the farmer should take what water he could get, paying a flat rate per acre, regardless of the quantity used, was the most common. Through the efforts of the Department of Agriculture these old contracts were modified by adding a provision that when the water-rights were all sold the canal property would be turned over to a stock company of the water users, and the stock issued in exchange for the water-right contracts. Throughout the arid section of the United States such stock companies are to-day the prevailing type. Both the State laws excepting the terms of the Carey Act and the Reclamation Act provide that works built under these laws shall be turned over to such companies. In addition, irrigation district laws have been enacted in a majority of the States, and under these many of the old ditches are being brought in by the water receivers and by them operated as mutual concerns. Thus home rule in irrigation is practically assured under all types of organizations, and here, too, as in the field of irrigation law, the evils most prominent at the beginning of the movement have no longer to be reckoned with.

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- 1 Irrigating a Prune Orchard, Santa Clara Valley, California
- 2 Irrigation in Pajaro Valley, California

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In bringing the work to its present high state of development most of the credit must be given to the Reclamation Service, which came into existence in 1902 with the passage of the Reclamation Act. On 13 Sept. 1903 the first contract was let, and, on 17 June 1905, an important project was formally opened in Nevada. Since that time progress has been remarkably swift and the activities of the bureau have been extended so as to embrace about 30 projects. These, up to the time of the last official statement from the Reclamation Service, had involved an expenditure of \$60,000,000. The story of the enormous work of the Reclamation Service is perhaps best told in figures. During the first 7½ years of its work the Service built 4,215 miles of canal. Joined successively to one another, these canals would reach from Washington, D. C., to San Francisco and back again to New Orleans, while several of them carry whole rivers. The Service has also excavated 47 miles of tunnels and constructed four of the biggest dams the world has ever seen. Its excavations of rock and earth amount to the enormous total of 60,000,000 cubic yards. Its roads have a total length of 417 miles; its telephones of 1,127 miles, and its levees of 70 miles. From its own mill it has turned out 340,000 barrels of cement, while it has also been found necessary to purchase 915,751 barrels from outside sources. Water is now available on 13,000 farms, representing a total area of 750,000 acres, as a result of the work of the Reclamation Service. Through its efforts also it is estimated that land values have increased to an extent of more than \$105,800,000, while the gross value of crops produced in 1910 on the lands irrigated by the government projects was \$14,033,000.

Entering the year 1911 with more than three-quarters of a million of acres of arid land under irrigation, the Reclamation Service has a rather smaller fund available for construction work than in previous years, and the organization, which is very elastic, has been cut down to fit reduced expenditures. This, however, will probably not retard the great work which is being carried on.

Reviewing the history of the Reclamation Service as a whole, its maximum activities and expenditures are found to be during the year 1907. In 1902 the expenditures were less than \$100,000; and in 1903 less than \$1,000,000. In 1904 they amounted to \$2,500,000, and the year following to exactly twice that. Again in 1906 the expenditures nearly doubled, reaching in that year \$10,000,000, only to attain their maximum in 1907 with \$14,000,000. Then they began to gradually decrease, dropping back again to \$10,000,000, in 1908, then to \$9,000,000, in 1909, and finally in 1910 to \$8,000,000. About \$7,000,000 will be available during 1911, and this amount will probably represent a fair average for future years, assuming that the water-right charges are paid as they fall due.

Right now is the most critical period in the history of the irrigation movement in this country since the formation of the Reclamation Service in 1902. By public notices of the Secretary of the Interior, issued in 1909, many water-right installments, involving about \$1,000,000 became due on 1 April 1910. As the repayments are made through the local

land officers and not directly through the Service, considerable time must elapse before the actual amounts collected are known. The date of payment is an important one both to the settlers, whose entries are liable to cancellation in case of failure to meet the payments due, and to the Reclamation Service, which is anxious to secure the return of the investment it has made in engineering work up to the present time. On a number of the projects, such as Sun River, Shoshone, and Huntley, the initial payments have already been made by the settlers, and it is practically certain that they will not be delinquent on the second installment, due in April 1911. They will thus be enabled to market two crops in the interval between payments. On several other projects, like the Minnidoka, Klamath, Lower Yellowstone, Belle Fourche, Carlsbad, Truckee-Carson, North Platte, and others of that nature, the first settlers have already had the use of water for two crops, and it is probable that a majority will be able to meet their obligations without difficulty. Detailed reports from various sources on each of the projects, which have been received at Washington, D. C., state that conditions as a whole are favorable for a large return to the reclamation fund. On several of the projects there will be no delinquents at all. On a number of others, although the engineering work is not yet fully completed, water is ready for large areas and is being supplied on a rental basis, pending the announcement of the actual water-right cost. Through these sources farmers have been enabled to largely increase the areas under cultivation, while the Reclamation Service has obtained substantial revenue from them. According to its last statement, the reclamation fund had received \$58,342,617.02 from sales of public lands under the Reclamation Act. Moneys received under operations of the Reclamation Act in cash and credits from all sources for work due amount to \$2,379,475.04. This is divided as follows: From town lot sales, \$103,673.91; from miscellaneous sales, water rentals, etc., \$1,694,844.77; from collections on water-rights, \$814,145.34. This tabulation does not include any of the sums collected for the water-rights falling due on 1 April 1910, owing to the fact that the latter are not yet all adjusted.

The practicability of irrigation, of course, depends entirely upon the relation between the cost of a water supply and the increase in crop returns due to the use of water. Water users must take into consideration the losses encountered in transmission, the seepage losses, and the further losses by evaporation and percolation. The cost of pumping must also be reckoned, as it varies according to the type of plant employed. The most common species of plants are as follows: Gasoline engines and centrifugal pumps; gasoline engines and deep-well pumps; steam engines and centrifugal pumps; steam engines and rotary pumps; electric motors and centrifugal pumps; electric motors and deep-well pumps; and air lifts. On all of these subjects the department of agriculture has compiled elaborate statistics, based upon investigations in all of the arid States. These statistics are available to all, and are of great aid to those who use water under any conditions. There is no question that proper, judicious, and economical irriga-

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tion will largely increase the yields of all crops, as the work of the last decade so adequately demonstrates. The Reclamation Service had educated the farmer in the proper use of water, and then supplied him with all necessary facilities. Everyone of the huge dams which rear themselves majestically heavenward in towering heights is a monument to the progress and prosperity of the United States.

In Wyoming, on the lofty mountains of the eastern rim of Yellowstone Park, with perpendicular walls 1,000 feet high, has been erected the highest dam in the world. This is the Shoshone dam (See DAMS). It is a wedge of concrete 328 feet from base to top. In the summer, when the crops are thirsting, the big gates of this dam are opened and the pent-up floods released into the river below. Another dam, a low structure, also of concrete, diverts the waters through a tunnel $3\frac{1}{4}$ miles long into a canal which passes for 40 miles along the upper edge of a broad and fertile valley containing 150,000 acres. Two years ago, before this great force of water had been brought under control, this area was a desolate waste. Now it harbors more than 200 farmhouses and three prosperous towns. More than 250 farm units of 40 to 80 acres each are at present still available to entry in this section, and offer exceptional opportunities to progressive home-seekers. The Belle Fourche project in South Dakota is another of the government's notable projects. Many miles of canals have been laid across the 100,000 acres of Belle Fourche's grass-covered prairie, and what but a short time ago was the finest free cattle range in the United States is rapidly developing into a thickly settled and equally fine agricultural district. An impressive engineering feature of this project is the Owl Creek dam, which is 6,200 feet long, with a maximum height of 116 feet, containing in all 1,600,000 cubic yards of material. The reservoir created by it forms the largest lake in South Dakota, and into it, by means of a canal $6\frac{1}{2}$ miles long, is turned the entire flow of the Belle Fourche River. It is expected that the amount taken out of this in the irrigating canals will, during 1911, supply 100,000 acres. In Montana the work of the Reclamation Service has resulted in no less than eight projects, most of which are now completed. The most important of these are the Huntley, Lower Yellowstone, and Sun River. All of these had been fully taken up by home-seekers before the close of the crop season of 1910, except an area of railroad grant-land on the Lower Yellowstone project which is now available at a maximum rate of \$2.50 per acre. The development of the valley since the beginning of the work of reclamation has been very rapid, and the time is near at hand when this will be one of the most prosperous districts in the Northwest.

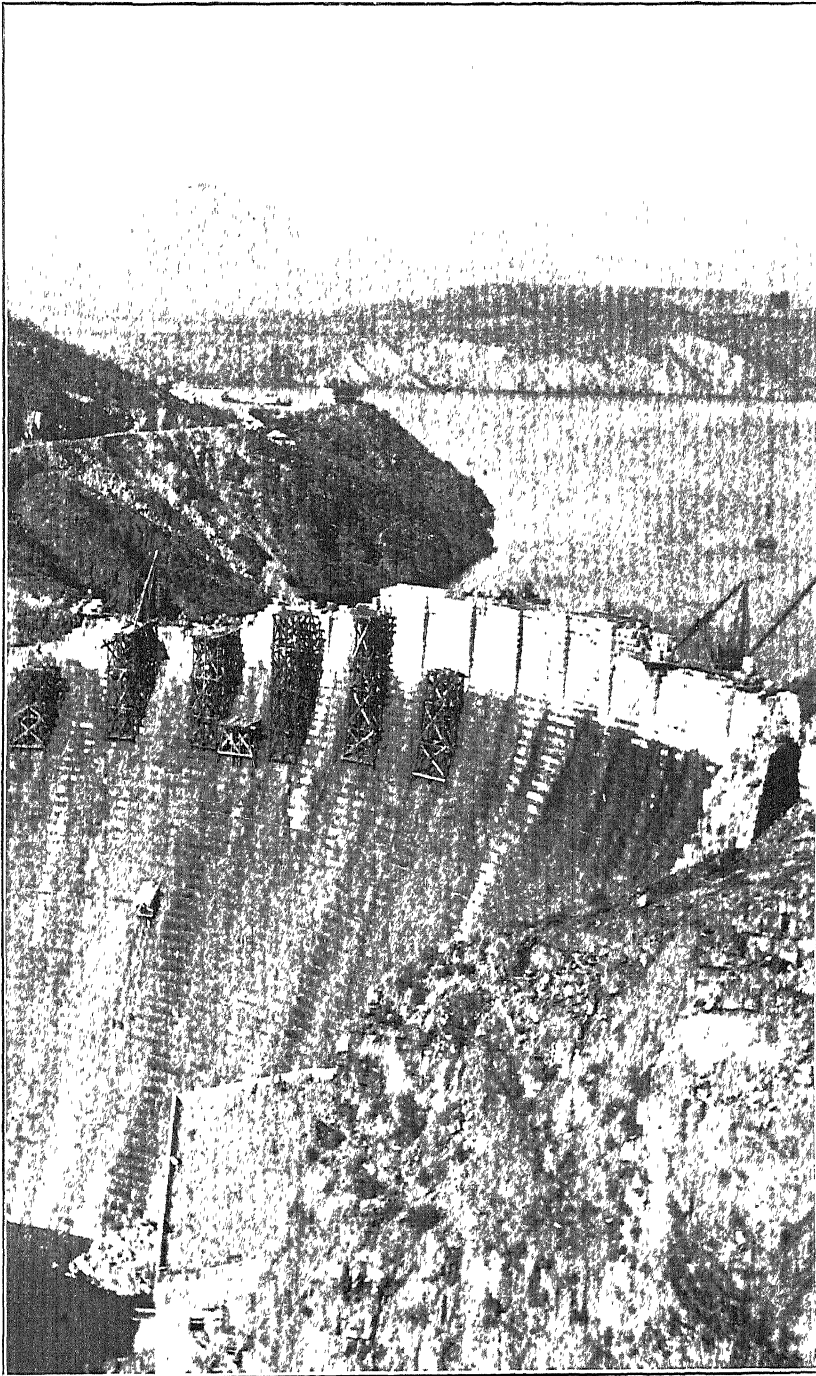
In the southern part of Wyoming, where the North Platte flows in a canyon, another masonry dam has been erected, which rises 215 feet above bedrock, and back of which is a lake whose capacity is sufficient to cover the entire State of Rhode Island a foot deep. Down the river several miles another structure of concrete diverts the stored water into a canal 95 miles long, from whence it is conveyed to the gently sloping valley lands of Wyoming and Nebraska. At present there are about 2,000

families living on the North Platte project, while the construction of this vast irrigation system has already increased land values in the valley more than \$4,520,000.

In the Uncompahgre Valley, in Colorado, the government has one of the most spectacular of all its projects. A great waterway, six miles long and capable of carrying a whole river, has here been excavated through a 2,000-foot mountain. This will irrigate a total of 140,000 acres. Plans are at present under way, too, for the opening of another project in Colorado, this one situated at Grand Valley, which will be capable of irrigating 53,000 acres, including some of the finest fruit land in the country. The engineering works which are now being constructed embrace a diversion dam of masonry, with a movable crest. The maximum height is 13 feet, the length 450 feet, while the work also calls for 71 miles of canals and 12,000 feet of tunnels. A project on the Snake River in Idaho has brought 2,500 families, to what five years ago was but a barren waste; and a railroad line along which four prosperous cities have sprung up almost in a night.

Located on the south bank of the Columbia River in Oregon, and extending up the valley of the Umatilla River, the Reclamation Service has erected the Umatilla project, which embraces 20,000 acres of land having an average elevation of 470 feet above sea level. All through Washington and Oregon the development due to irrigation has been very great during the last five years, and it is only a presager of what is to follow. Drained by the noblest river of the West, with soil of great depth and fertility, and a climate suited to the cultivation of vegetables of all kinds, and of cereals and forage crops of the north temperate zone, this may be truly termed the Inland Empire of the United States. It is in Washington, in the valley of the Yakima River, on the eastern side of the Cascade Mountains, that the government has one of the greatest of all its irrigation projects, although new structures of mammoth proportions are undertaken so constantly that it is difficult to say from day to day with accuracy just which is the largest. The Yakima River project, however, has a concrete dam which turns the water into the Sunnyside canal and will ultimately irrigate 94,000 acres. This canal, the Tieton, winds hundreds of feet above the river, around the edge of a perpendicular cliff, while more than two miles of it is enclosed in a tunnel. What irrigation has done for this immediate district is shown by a glance at some of the crop yields, which are as follows: Strawberries, \$150 to \$400 per acre; cherries, \$150 to \$350 per acre; peaches, \$200 to \$1,000 per acre; and apples, \$200 to \$800 per acre. Such unprecedented profits are of themselves enough to draw thousands to the spot.

The Yuma project, the first unit of which on the Colorado River in California, was opened 1 March 1910, is another of the government's huge undertakings. A tunnel has been bored under the river in which it is proposed to lay a concrete-lined siphon 1,000 feet long, with an internal diameter of 14 feet. A high power will be developed at the outlet of this siphon, which will be utilized to lift water to the lands above the gravity system. In the siphon, too, a portion of the waters of the big



ROOSEVELT DAM, ARIZONA
Salt River Irrigation Project

IRRIGATION — IRVINE

canal on the California side will be passed under the river to the canal on the Arizona side. But Arizona has all to itself one of the vast works of the Reclamation Service, designed to provide an adequate water supply for 240,000 acres of land in the Salt River Valley. Here it is that the Roosevelt dam (See DAMS) stands. This is, in many respects, the most remarkable structure of its kind in the world. Its towering height of 280 feet and its length on top of 1,080 feet, combined with the enormous capacity of the reservoir created by it, combine to make it one of the most stupendous engineering feats of modern times. The Salt River reservoir, connected with it, when full, has a capacity great enough to fill a canal 300 feet wide and 19 feet deep, extending from Chicago to San Francisco, while it is also capable of submerging the whole of the city of Chicago to a depth of 11½ feet. The great increase which the erection of this project has effected in land values there goes without saying.

The same can be said, too, of all the other sections to which the Reclamation Service has penetrated—and those which have escaped it are few. The Klamath project in Southern Oregon, located in a region of unrivalled scenic beauty; the Boise Valley, in Idaho, and the Orland project in the Sacramento Valley, the land of fruits and flowers—all these hold out the same promises, and, through the work of irrigation, make good those promises. The Rio Grande project, lying in New Mexico and Texas, includes several units which will be pushed along during 1911. When completed, this will be one of the largest projects in existence. It will include the Rio Grande dam, the Leasburg Division dam, which, already completed, is capable of irrigating 25,000 acres of Mesilla Valley, and the huge Engle dam. Altogether the project will supply water for 1,000,000 acres of land. Even in the East, irrigation is beginning to be practiced, and although the methods of securing a water supply and applying it are much more expensive than in the arid sections, as damaging droughts become more and more frequent, it is bound to extend. At present it is here most extensively practiced in the growing of the fall, winter, and spring truck crops along the Atlantic Coast from Virginia to Florida. Everywhere in the country practically it is performing the work of agricultural regeneration and creation. Irrigation has come to be more than a mere aid to intensive farming. It is the very breath of life of the agricultural prosperity of this country.

The difficulties which brought about the overflow of the Colorado River into the Salton Sink in Southern California and delayed the settlement and irrigation of the Imperial Valley, are to be overcome by the construction of a dam and levee to control the river. This work was attempted previously with considerable success, but had the effect of diverting the water in such a manner as to make it certain that in a few years the Colorado River would change its course to such a degree that it would be impossible to take water from it for irrigation purposes. To prevent this the river is once more to be returned to its old channel and to insure its retention, a levee nearly 50

miles long is to be built under a charter granted by the Mexican government.

Irving Statue. A bronze statue of the late Sir Henry Irving was unveiled on 5 Dec. 1910, by Sir John Hare in Charing Cross Road, behind the National Gallery, London. The statue represents the late actor standing with one hand on his hip and other holding a roll of manuscript. A doctor's robe is draped over a frock coat.

Irvine, Alexander, American Socialist: b. Ireland, 1861. He was the son of a cobbler and sold newspapers in his native village. He learned to read and became a soldier in the expedition sent to the relief of Gordon at Khartoum. He was then midshipman on a British man-of-war where he was noted as a boxer. On his return to England he studied under Jovett at Oxford and decided to work in the Christian Church. On coming to America he drifted from one business to another. While driving a milk wagon he began mission work in the Bowery and was beset by the other missionaries to employ his whole time in the mission work, which he refused to do, preferring to earn money in other ways and give his religious labor free. He worked for a publishing house at \$25 per week with assurance of an advancement to \$50, and at that stage of prosperity he went back to the Mission and accepted their offer of \$15 per week for all his time, day and night. He drew crowds to the churches in which he spoke, and one of the pastors complained that his "bums" were taking up all the seats and that Irvine must take them out to make room for his regular congregation. At his suggestion an old church was secured and he filled it to overflowing. He continued mission work in the West for a few years, returning to New Haven, Conn., in order to continue his theological studies, and while there he continued free mission work, refusing the pastorate of three different Congregational churches. The fourth offer he accepted on condition that he could run it to suit himself. He displeased the parishioners, however, by speaking at public places on socialistic questions and they dismissed him. In 1907 he left the Congregational Church and made a contract with the vestry of the Church of the Ascension, on 5th avenue, New York, to serve as lay reader, under authority of the Protestant Episcopal bishop of New York, and in conjunction with the Rev. Percy Stickney Grant, rector of the church, and his Sunday night meetings were held in the chapel of the parish house. At these meetings subjects on Socialism and its allied branches; race suicide, the socialistic attributes of Christ, and the eight-hour labor law were discussed and attracted crowds of interested listeners and ready debaters. The popularity of Irvine and the class of listeners he drew together caused the press and the general public to stigmatize the Church of the Ascension as the "Socialist Church," and in Nov. 1910 the vestry, at the expiration of the three-years contract, decided to dispense with his services. After leaving the Church of the Ascension he went to his farm at Happy Hollow, near Peekskill, N. Y., and his novel, 'The Magyar,' dealing with the socialistic question outlined the founding of the Church of the

ITALIAN SOMALILAND—ITALY

American Socialist, of which, he announced, he was willing to become "spiritual director" and "captain-general"

Italian Somaliland. The Italian Protectorate of Somaliland, on the eastern coast of Africa, comprises the Northern Somaliland Protectorate, the territory of the Nogal from Cape Gabbel to 6° 47' N latitude, the Sultanate of Obbia, between the parallels of 6° 47' and 4° 30' N. latitude, approximately, and the Colony of Benadir. The total area is about 129,700 square miles, and the estimated population, 400,000. The principal cities of the country are Mogadisho (10,000 inhabitants), Merka (7,000), Brava (5,000), Mereg, Italia, and Warsheik—all of which are in the Benadir district. The northern frontier-line runs between points on the Gulf of Aden and the Indian Ocean. The southern boundary extremity is the Juba River. A treaty of 1908, between Italy and Abyssinia has fixed the inland boundary-line, to lie between Dolo on the Juba River, and the point where the Juba joins the Dana River; further extending so as eventually to reach the Anglo-Abyssinian frontier-line. The government seat is Mogadisho. The governor of the colony conducts the civil administration only. The Italian Government expended about \$54,550 in the interests of the Protectorate in 1909-10. The local revenue for 1909-10 amounted to \$131,050. The civil expenditure was about \$228,750. Bronze coins are being minted for Italian Somaliland. Livestock is the chief resource in the colony. Camels and sheep exist in large numbers. The leading imports into the Protectorate are yarn, timber, oil, rice, sugar, and cottons. Exports consist chiefly of butter, timber, hides, and durra. A great deal of the export trade passes through Zanzibar. Total annual imports are valued at about \$500,000, and the exports at about \$300,000.

Italy. A constitutional monarchy in southern Europe. In addition to the Italian Peninsula, it includes Sicily, Sardinia, and many minor islands.

In spite of the extent to which Italy figures in our literature, and the thousands of Italian immigrants who have come to the United States in recent years, Italy may be called a country still not well understood by the American public. The character of the various provinces is distinct, owing to their origin and to the fact that for centuries they were independent, often warring kingdoms, and the people, as a whole, have characteristics formed in their struggle for liberty, and in the hundreds of years during which Italy was, notwithstanding her naturally rich resources, one of the poorest countries in Europe. The civilization of Italy is the oldest in Europe, and while in some ways it has not greatly changed since the Roman era, in others it is marvellously adapted to a complex and difficult and essentially modern situation. The Italians have been called the clearest-headed business people in Europe, and in America they are rapidly proving their business and executive ability.

Area and Population.—The following table gives the area and population of the various provinces as estimated in 1909:

Province	Area	Population
Piedmont	11,336	3,468,158
Liguria	2,037	1,194,749
Lombardy.	9,297	4,591,412
Venetia	9,475	3,461,924
Emilia	7,990	2,548,850
Tuscany	9,304	2,701,031
Marches	3,749	1,080,945
Perugia	3,608	609,035
Roma	4,663	1,323,609
Abruzzo Molise	6,380	1,467,805
Campania	6,290	1,358,815
Apulia	7,176	2,009,945
Potenza	3,815	475,104
Calabria	3,819	1,429,054
Sicily	9,015	3,744,424
Sardinia	9,306	601,294
Total	110,550	34,269,764

The number of foreigners in Italy in 1901 was 61,606, 11,616 were Austrians, 10,757 Swiss, 6,953 French, 8,768 English, 10,745 Germans, 1,503 Russians, 2,907 Americans, 704 Greeks, 1,400 Spaniards, and the rest Turks, Belgians, Scandinavians, Dutch, Egyptians, Argentines, and Brazilians.

In 1908 the total emigration was 486,674, of whom 248,101 went to other European countries or to those bordering on the Mediterranean, and the rest to countries overseas. The Argentine receives a considerable Italian emigration. The number of Italians abroad in 1901 was estimated at about 3,345,000.

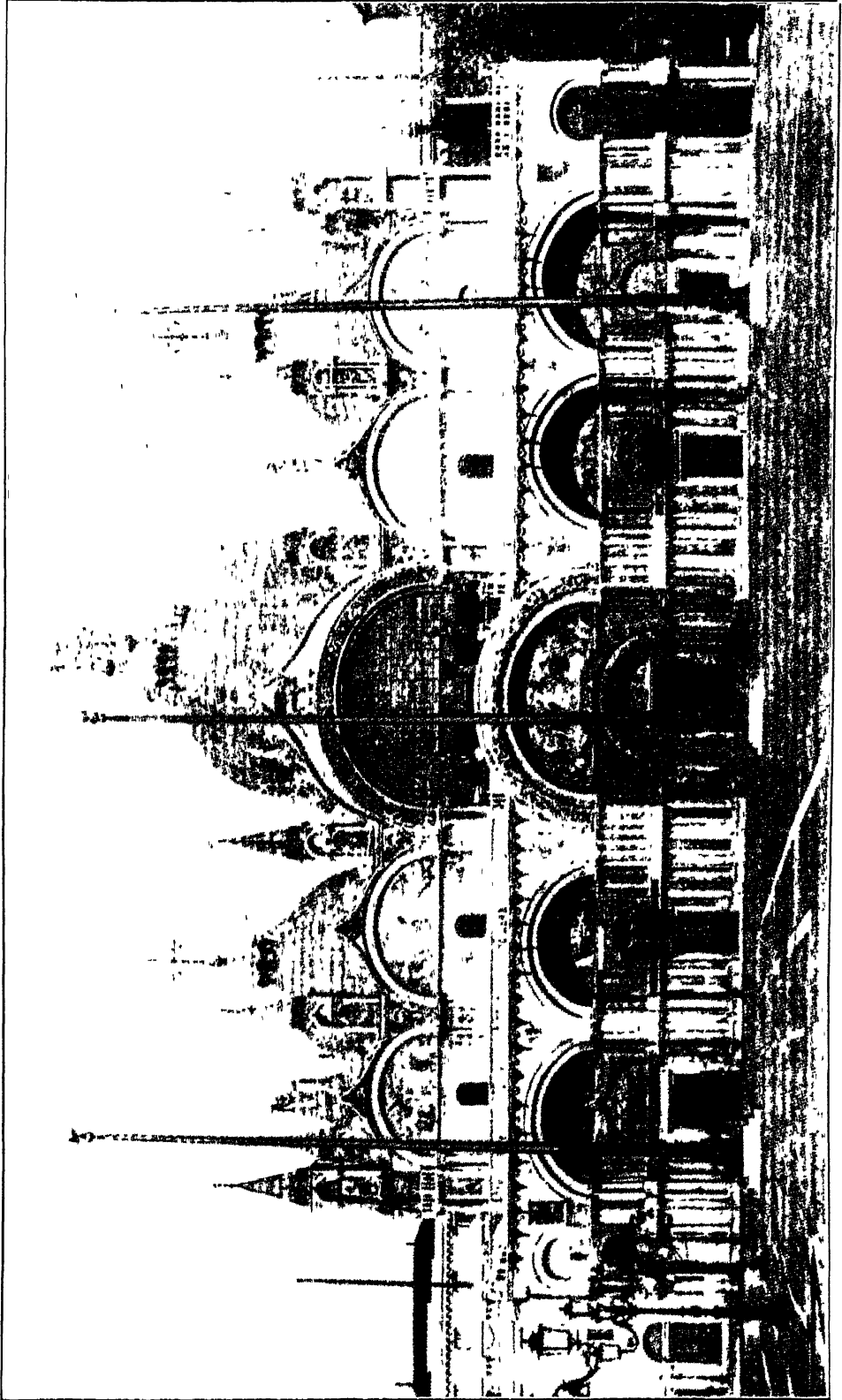
The urban and rural population in Italy exists under somewhat peculiar conditions. In Southern Italy and in the islands, the country people live in the towns, coming and going to cultivate their plots of land; this has been so since the earliest days of Rome. The population of the cities having over 100,000 inhabitants is as follows: Naples, 506,000; Milan, 584,000; Rome, 575,000, in 1909; Turin, 371,000; Palermo, 319,000; Genoa, 275,000; Florence, 227,000; Bologna, 165,000; Venice, 160,000; Messina, 149,778; Catania, 163,000, and Livorno, 108,000. Ferrara and Padua have 82,000 or more.

The population, exclusive of children under nine years, in 1901 amounted to 25,386,507; of these, 9,611,003 were engaged in agriculture, forestry, and cattle-rearing, and 8,355,773 were dependents. The next largest number were engaged in the making of clothing and adornments, and numbered 1,113,843. Nearly 500,000 are occupied in domestic service.

Government.—The constitution of Italy is an expansion of the "Statuto fondamentale del Regno," granted 4 March 1848, by King Charles Albert, to his Sardinian subjects. The executive power belongs to the sovereign, and is exercised by him through responsible ministers, while the legislative authority rests conjointly in the King and Parliament.

The present King, Vittorio Emanuele III, was born 11 Nov. 1869, and succeeded to the throne on the death of his father, Umberto I, on 29 July 1900; on 24 Oct. 1896, he married Princess Elena, of Montenegro. Prince Umberto, the heir apparent, was born 15 Sept. 1904, and there are three daughters, the Princesses Yolanda, Mafalda, and Giovanna.

The Senate consists of princes of the royal house and an unlimited number of members nominated by the King for life; they must be above 40 years old, and have rendered some service to the State, or pay taxes to the annual amount of 3,000 lire. The Lower House consists of 508 deputies, or 1 to about 65,000 of



THE CHURCH OF ST. MARK, VENICE

ITALY

the population. Salaried government officials and the clergy cannot be elected to the Lower House. The duration of a Parliament is five years, and it must meet annually. The ministry consists of departments as follows: President of the Council and Minister of the Interior, and Ministers of Foreign Affairs, Justice and Ecclesiastical Affairs, the Treasury, Finance, War, Marine, Public Instruction, Public Works, Agriculture, Industry and Commerce, and Posts and Telegraphs.

In 1909 there were 8,314 communes; each according to the law of 21 May 1908, has a communal council, a municipal council, and a syndic.

Finance.—The estimates for the year ending 30 June 1910, amounted to 2,289,459,892 lire expenditures, and 2,345,435,149 lire revenue. Direct taxes are those on lands, on houses, and on incomes derived from movable capital and labor. The tax on lands amounts to about 96,000,000 lire. That on houses is at the rate of 125 per cent (with 3 additional) of the amount taxable, which is two-thirds of the real annual value in the case of factories, and three-fourths in the case of dwelling-houses. The tax on incomes from movable wealth was raised to 20 per cent of the amount taxable. The amount taxable in the case of incomes varies from the whole income to 15-40 according to various conditions. The communes and provinces also tax lands and buildings. The State grants to the communes one-tenth of the proceeds of the tax on incomes as compensation for other communal revenues made over to the State by various laws. The principle indirect taxes are the customs duties, the octroi, the taxes on manufacture, the salt and tobacco monopolies, lotto. The public debt, per head of population, is nearly \$46.

Army.—See ARMIES OF THE WORLD.

Navy.—See NAVIES OF THE WORLD.

Education and Religion.—The State maintains, either entirely or in conjunction with the commune and provinces, public schools of every grade, but education is compulsory only in the lower grades. Religious instruction is given when parents request it.

In the last 40 years there has been an increase of 121 per cent in school attendance. The total budget of State funds by the Ministry of Public Instruction in 1908 was 3,495,680 lire. The statistics regarding number of schools of the various classes are as follows:

Schools	Number	Teachers	Pupils
Infant.....	3,374	7,609	355,594
Public.....	53,259	56,433	2,548,583
Private.....	8,518	9,306	184,766
Evening.....	5,404	5,683	178,311
Higher girls.....	233	1,906	9,347
Normal.....	137	.....	21,739
Licel.....	159	.....	13,529
Ginnasi.....	288	.....	34,788
Tech. inst.....	77	.....	17,803
Technical.....	316	.....	70,382
Mercantile marine institutes.....	19	.....	2,085

The statistics of Italian State and free universities in 1909 show 23,644 students and auditors.

There are also schools of agriculture, mining, industrial, and commercial schools, etc.

While the Catholic Church is the ruling State religion of Italy there is freedom of worship for the adherents of all religions. The

percentage of Catholics was 97.12 in 1901; Evangelical Protestant, 0.20; Greek Church, 0.01; Israelite, 0.11. Of the Protestants, 22,500 belonged to the Waldensian Church of Piedmont; 30,000 to foreign Protestant bodies, and 10,000 to the other Evangelical Italian churches.

The number of Catholic parishes is about 20,000, the secular clergy nearly 70,000, monks, lay-brothers, nuns, etc., 48,000; sacristans, etc., 12,000.

Agriculture.—There are three systems of cultivation in Italy; peasant proprietorship, partnership, and rent. The first is most common in Piedmont and Liguria, the second in Tuscany, the Marches and Umbria, and the third in Lombardy and Venetia. The land is generally much subdivided, but large farms exist near Vercelli, Pavia, Milan, Cremona, Chioggia, Ferrara, Grosseto, Rome, Caserta, and in Apulia, the Basilicata, Calabria, Girgenti, and Trapani. The principal crops by acres and their products in bushels (1908) are shown in the following table.

Crop	Acres	Bushels 1908
Wheat.....	12,616,760	147,534,000
Maize.....	4,443,530	92,988,500
Rice.....	372,976	25,830,750
Wine.....	9,284,730	142,309,750
Olive oil.....	2,714,530	1,738,000
Tobacco.....	13,436	.....

The average yearly yield of tobacco is about 6,750 metric tons. Italy's imports of farm animals considerably exceed the exports. Silk culture is carried on throughout Italy, especially in Piedmont and Lombardy. The average annual production is estimated at 55,527,000 kilogrammes of silk, cocoons, and 5,784,000 kilogrammes of silk. Within 10 years the number of sugar factories has increased from 4 to over 30, in 1908 there were 32, with an output of 139,965 metric tons.

The forest area, exclusive of chestnut plantations, is about 4,093,000 hectares, and the yield from the forests is valued at 36,018,000 lire in timber, 49,092,000 in firewood, and 39,421,000 in charcoal, which forms an important product, being used for cooking, and to some extent for heating, everywhere in Italy. Chestnuts also form a rather important product in the support of the people, being used for meal of which bread is made, and also in soups, as well as eaten uncooked, boiled, or roasted. Wheat is used largely in the form of bread or macaroni, there are over 30 different forms of macaroni and spaghetti; maize is used in the form of corn-meal in making polenta, another staple food. Olive oil is used almost entirely for cooking in place of butter or fat. Goats are raised to a considerable extent, over 5,000 were imported in 1908. There are several kinds of Italian cheese which are made from goats' milk. Fishing is an important industry in the feeding of the population; in 1908, 26,117 vessels and boats were employed in the fisheries, with an aggregate tonnage of 76,002, and 104,283 fishermen. This includes 255 boats engaged in coral fishing. Vegetables of various kinds are raised by the peasants throughout Italy, and used in salads, soups, and stews; the various forms of lettuce, tomatoes, and herbs are thus used, and melons are also commonly raised where the climate permits, with fruit of various kinds. The greater part of these agricultural products are used as food for the people, and supply the cities and the

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inns; but there is a considerable export trade in some of them. Considering the size of the country a surprising amount of foodstuff is exported, and it may be said, in a general way, that Italy imports no foodstuffs that can be produced at home.

Exports and Imports.—Some of the leading imports and exports in 1908, in lire, were as follows: Imports. Raw cotton, 285,305,892; coal and coke, 262,021,920, boilers and machinery, 252,517,510, wheat, 123,999,805; wrought iron and steel, 128,197,131; raw silk, 138,206,500; timber, 125,250,561, wool, 90,175,140, silk cocoons, 56,521,825, cured fish, 79,510,160, hides, 56,962,265, copper, brass, bronze, etc., 43,562,172, scientific instruments, etc., 56,413,655, silk manufactures, 37,102,395; woollen manufactures, 42,371,800 Exports: Raw silk, 498,938,500; cotton tissues, 91,079,250; silk tissues, 94,073,704; olive oil, 53,028,170; dried fruits, 53,873,144, wines, 48,947,957; raw hemp, 45,113,565; cheese, 41,699,720; fresh fruits, 24,166,949, eggs, 46,610,550; silk waste, 40,411,225; acid fruits, 34,940,301, sulphur, 32,307,455, hides, 36,930,170; automobiles, 28,236,745.

The total imports, exclusive of precious metals, in 1908, amounted to \$582,655,000, total exports, \$345,852,000; imports of precious metals, \$5,600,000, exports, \$4,200,000.

Some of the export trade in dried and preserved fruits, vegetables, etc, goes to countries where there is a large Italian population demanding these goods; this is true of such canned goods as the tomato conserve, and fish and mushrooms prepared in oil, found in Italian groceries in this country. The best olive oil also goes in great measure to this trade. The trade with the leading countries is shown in the following table:

Countries	Imports 1908 (1,000 lire)	Exports 1908 (1,000 lire)
Germany	520,975	245,530
United Kingdom	500,893	131,854
United States	404,994	203,826
Austria-Hungary	300,682	144,877
France	276,265	203,801
Russia	127,711	11,850
British Possessions in Asia	121,237	19,532
Turkey in Europe, Crete, Montenegro, Servia, Rumania and Bulgaria	82,772	67,718
Switzerland	80,468	297,400
Belgium	75,254	36,489
China	72,058	2,272
Argentina	65,677	149,675
Spain and Gibraltar	33,078	11,296
Brazil	26,022	18,008
Egypt	24,904	50,557
Japan	21,873	1,470

Manufactures and Minerals.—The manufactures are extremely numerous, and besides those listed there are numerous factories and cottage industries which produce goods sold to tourists in Italy. In 1903 the silk industries employed 191,000 people, woollen, 38,000; cotton, 140,000; hemp, linen, etc., 26,000; the value of industrial chemical products in 1908 was 138,638,000 lire. The quarries of Italy employed, in 1908, 69,108 persons, and the output of stone was valued at 33,804,776 lire, nearly 19,000,000 lire being for marble. Over 98,000 persons were employed at lime and brick kilns. The number of workers in mines, in 1908, was 54,093. The most important mines are those of sulphur, of which there are 426, producing 2,847,943 metric tons, valued at 32,095,016 lire

in 1908, and employing nearly 24,000 people. Sicily has for centuries been an important sulphur region. Next in importance is iron, there being 31 iron mines with 2,406 workers, producing 539,120 metric tons of iron, the value of the zinc products was 14,483,298 lire; lead, 6,681,765. Manganese, copper, silver, gold, antimony, mercury, iron and cuprous pyrites, mineral fuel, asphalt, and boric acid, graphite, and petroleum are also found, and the total value of the mineral products is estimated, in 1908, at 80,075,847 lire.

Communications.—The length of State railways, in 1909, was 7,992 miles; all railway lines, 10,445 miles. In 1909 the total receipts were about 180,000,000 lire. There are 31,150 miles of telegraph, 7,000 telegraph offices, of which 5,064 were State offices and the rest railway offices. About 12,000,000 telegrams are sent annually. The telephone service, which passed to the direct working of the State in 1907, had 43,809 stations, 141 urban systems, with 4,460 miles of line and 254 interurban systems with 7,553 miles of line. There are 9,772 postoffices.

Social Conditions.—In Italy legal support of the poor does not exist. Permanent charitable foundations, known as "Opere pie," exist, to the number of 27,078, with a gross capital of about 2,205,000,000 francs, and a net income of 52,559,000 lire, to which may be added contributions increasing the income to some 120,000,000 lire.

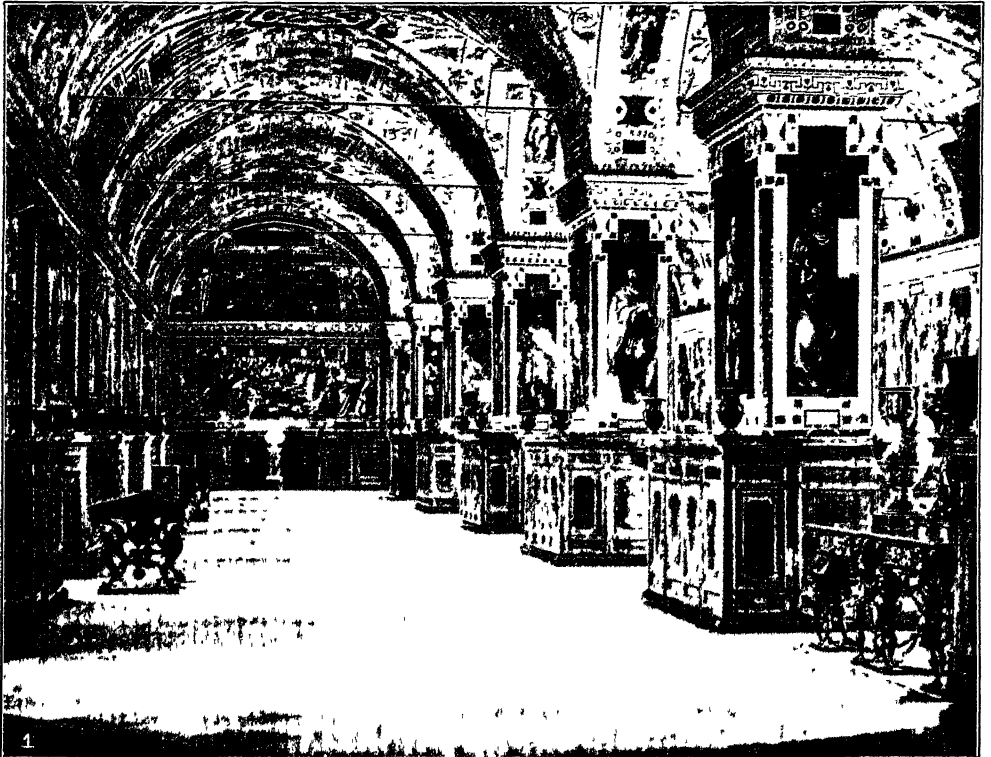
In 1908 there were 47,808 male and 4,753 female prisoners, and 343,829 persons were convicted of offences of all kinds during 1908. In 1908 illegitimate births amounted to 56,726 out of a total number of 1,138,702 births.

The surplus of births in 1908 was 368,667; number of deaths in that year 770,035, including 77,000 estimated to have been killed in the earthquake of 28 Dec. 1908.

The problem of living in Italy is a peculiar one owing to three separate causes; first, the climate is such as to permit existence to be supported at a very low cost; second, the money and natural resources in the country are very small in proportion to the population; third, the working population has been greatly depleted by the emigration of large number of the young and able-bodied to America and elsewhere. In large sections of the country, the people under ordinary conditions live so near the brink of pauperism that any extraordinary occurrence, such as the Messina earthquake, reduces thousands at once to absolute destitution. The enterprising Italian who emigrates does not, as a rule, come back to spend his money in Italy; he sends for his family to come to the new country (which is not an Italian colony), and this leaves behind a disproportionate number of dependents.

History, 1910.—While Italy and Austria are nominally at peace, there is evidence enough that the feeling of the Italians against the Austrian rule is still as strong as ever. The present treaty between the two countries will come up for a renewal in 1913. Meanwhile, Austria is planning a complete reorganization of her army and building four new battleships. A meeting was arranged to take place 24 Sept. 1910, between Marquis di San Giuliano, the Italian Minister of Foreign Affairs, and Baron

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1 Vatican Library, Rome

2 Sistine Chapel, Vatican, Rome

Aehrenthal, Chancellor of the Austrian Empire, but it did not clear away the war clouds, and the strained relations between Italy and her northern neighbor are unchanged. Italy, on her side, has been building a series of forts, at a cost of many millions of lire, in the gap of some 60 miles width, through which Teutonic armies have for centuries been able to enter Italy. This has reduced the open space to 20 miles, and its complete fortification is only a matter of time. The statesmen of the two countries want no war, but they see clearly that war is possible, if any particular incident should happen to inflame the spirits of the people. Italians who are enthusiastic over a "Greater Italy" claim that their country's natural frontier is the main chain of the Alps marked by the St Gothard Pass in Switzerland and by the Brenner Pass in the Austrian Tyrol. South Tyrol has a large German population, but the part furthest from the Brenner includes the two old Venetian cities of Trient and Riva. "Italia Irredenta" or "Unredeemed Italy," is the part of Austria which was once Italian, or is now commercially controlled by Italians, and includes Austria's chief port, Trieste, Styria, and Hungarian coast of Croatia, Fiume, and all Dalmatia as far as Albania. While the people of this east Adriatic region are Slav, not Italian, Italians people the coasts and conduct the business of the towns, and while Trieste has belonged to Austria since the 14th century, it has always enjoyed a large measure of liberty, and Italian is generally spoken there. In these provinces the Italian society of Dante Alighieri works with the Austro-Italian "Lega Nazionale Italiana," and both are combating Austrian and German influence by every means in their power. Whether Italy could win in a war with Austria is extremely doubtful. The fighting strength of the two countries is not very unequal at present, and Austria has the prestige of past victories. But the fact that the Italian national spirit has been steadily growing for nearly half a century is to be taken into account, and if Italy should succeed in making Austria fight prematurely a Greater Italy might perhaps result. Meanwhile both sides of the frontier are armed to the teeth, with Austrian Jaegers and Italian Bersaglieri.

The greatest calamity which has ever befallen any one city from natural causes overwhelmed Messina on 28 Dec. 1908, when an earthquake totally destroyed that city and also Reggio, on the Calabrian mainland, and many villages in Calabria and Sicily. It was followed by a tidal wave and by fires which increased the loss of life. No accurate estimate of the number of dead has ever been made, but it certainly was 75,000 and may have been 100,000. The King and Queen of Italy were on the spot almost immediately, organizing and guiding the relief work, to which they themselves gave \$540,000, and contributions from all civilized countries poured in without stint, reaching the sum of \$4,300,000. The city has not yet been rebuilt, although a population of over 50,000 is living among the ruins in hastily constructed huts. On 2 Nov 1910, the Italian Government finally decided against rebuilding the city on its old site. An area of 20,000 square meters in the plain of Mosella, near the destroyed city, has been selected, and only

houses of modern design, with iron frames, and not more than three stories high, will be built.

In the latter part of Oct. 1910, a hurricane and tidal wave, accompanied by eruptions from Mount Vesuvius and Mount Epomeo, destroyed Cetara and caused loss of life in several small towns near Naples. The total number of deaths was at least 200. As the time of the Messina disaster, King Victor Emanuel was personally on the scene soon after the catastrophe.

The finances of Italy are at present in a satisfactory condition. It is in the somewhat exceptional condition of having an annual surplus, which no other country in Europe has except perhaps Russia. The fiscal year, in 1910, closed with an excess of 69,000,000 lire over the regular expenses of government. Of this amount 50,000,000 was used for urgent needs, including the relief of the earthquake sufferers, but there still remained a surplus. The Italian Ministry point out the fact that the national treasury has been able to expend \$35,000,000 for works of relief and restoration without resorting to a loan.

On the other hand, the common people of Italy, in contrast with those of many other countries, are almost incredibly poor. A clerk in the postoffice, for example, wrote, in 1910, a letter to a Roman paper showing how he managed to support a wife and three children on a salary of \$300 a year. Rent consumed \$6 a month, food less than \$10, and there was about \$4 for clothing, doctors' bills and extra expenses. The salaries of postoffice and telegraph clerks range from \$180 to \$400 a year. This extreme poverty of the people, as a whole, makes the number of absolutely destitute, in case of any calamity, include practically the whole population.

A controversy which attracted world-wide attention in the later part of Sept. 1910, arose from an anti-Catholic speech by Mayor Nathan, of Rome, at the Porta Pia on 20 September. This was held by many Catholic leaders to be a violation of the Law of Guarantees, which promises respect to the person of the Pope. It is regarded by them as the beginning of an anti-clerical movement which will place the Radical Socialists in power, drive out ecclesiastics, abolish clerical instruction, and destroy religious traditions generally. Later, Mayor Nathan charged American hotel-keepers and Italian clericals with spreading reports of cholera in order to detract from the success of the celebration of 1911. At that time there will be an exposition in celebration of the anniversary of the proclamation of Rome as the capital of United Italy. Mayor Nathan, on his side, claims that he only exercises the right of free speech.

Some disquiet has been caused in Italy by the prospect of an influx of religious from Portugal. The religious from France came to Italy in large numbers after the secularization there, and the poorer people hold them responsible for the acute rise in ground rents in Rome and other large cities, which has driven the working people out of comfortable buildings.

Great preparations are under way in Rome for the exposition, and some of the old buildings are being restored, while slum streets are in some cases being swept away and replaced with modern blocks.

There was a report during 1910 that the Tower of Pisa was likely to fall, but this has been contradicted. The report is said by Prof. W. H. Goodyear, curator of the fine arts museum of the Brooklyn Institute, to have been based on a misapprehension of the statement of certain authorities by whom surveys of the tower were published early in the 19th century.

An architectural experiment which is to be tried in Milan is the first example of a "skyscraper" to appear anywhere in Italy. It shall be 14 stories high. In most Italian cities there is a law that a house may be only as high as the width of the street on which it stands. Italians demand light in their living rooms, and it seems doubtful whether they will take generally to the idea of tall buildings. In the United States they will rarely be found in dark rooms for a very long time, soon migrating into the country, where they can have small houses with gardens.

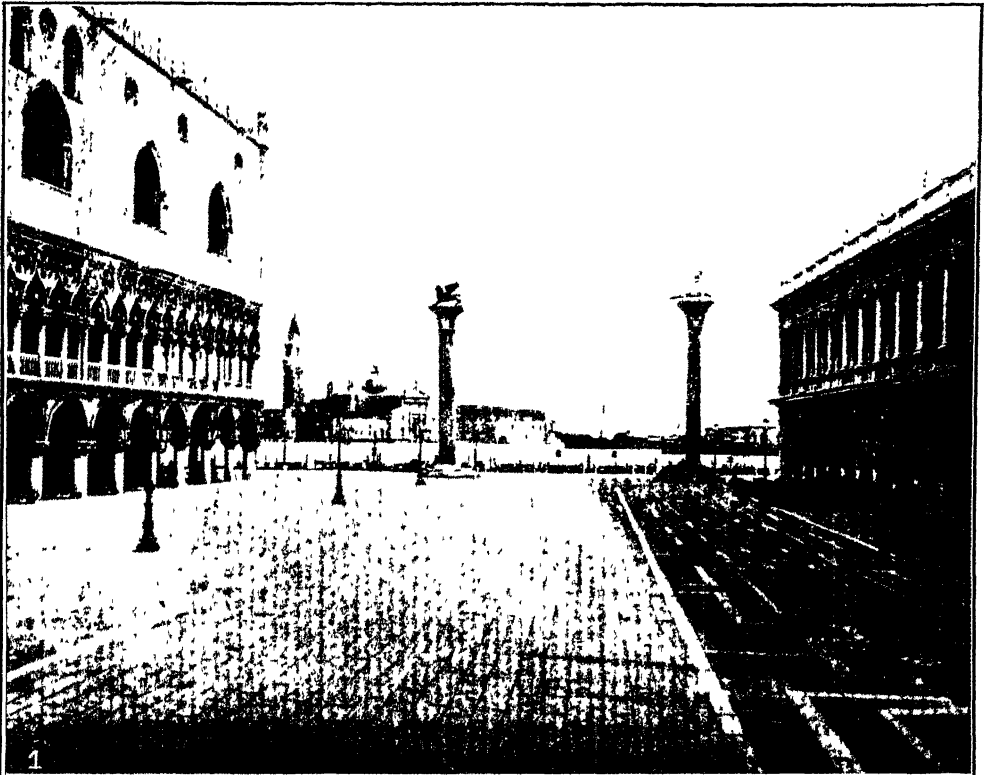
Ito, Prince Hirobumi, Japanese statesman. b. 1841, Shimonoseki, Japan, in the province of Chosu; assassinated at Harbin, Manchuria, 26 Oct. 1909. His early name, given by his parents, was "Shunsuke," which means "Superior Being"; but in later years, after he had come into touch with western civilization, he discarded this name and adopted that of "Hirobumi," which means something like "Good Literature," or, more exactly, "Benevolent Literature." While a young man he was sent by the Lord of Chosu to Tokyo to gain certain information which would assist in the conduct of a rebellion then being waged against the Shogun. The mission was successfully accomplished—too successfully for the Lord of Chosu's interests, as the outcome proved; for Ito had obtained, at Tokyo, a glimpse of another civilization beyond the confines of the tight little isle of Japan, and he thirsted to learn what it had to teach. It was not long, therefore, after his return to Shimonoseki, that he and four companions swam out, one dark night, to a whaling vessel and persuaded the captain to take them to England. From Shanghai, the first port at which a stop was made, three of the young Japanese went to England as passengers, but Ito and Inouye Kaoru, being made of sterner stuff, worked their way before the mast. Ito's stay in England was cut short by the necessity of returning to his native country in order to play his part in the stirring events that led to the rejuvenation of Japan; but he was abroad long enough to recognize the fact that the new Japan needed the leaven of western ideals. He was at first looked upon with suspicion by the feudal faction, and in the course of the rebellion his life was sought by assassins; but here romance took a hand, for he was saved by the strategy of a girl whom he afterwards married. The rebellion finally broke up the ancient feudal system, seated the Emperor on the throne of a united nation, and Ito, because of his enlightened and progressive views, obtained and held commanding influence in shaping the advanced policies of the new administration. He became the first governor of Kobe, when, after one year's service in that important post, he was made minister of public works, with headquarters at Tokyo, and was instrumental in securing the building of a railway from Yokohama to Tokyo. His next distinguished service was a two years' tour of

Europe and the United States in company with other statesmen of high rank. On this tour he made a profound study of the constitutions of various nations, finding himself especially impressed with that of Germany, upon which he later based the constitution of Japan. In the United States, he studied our financial history and modeled the present coinage of Japan upon our decimal system. In the important years following his return, he was a leading spirit in drawing Japan away from the Chinese models upon which it had been built, and establishing it upon lines of western jurisprudence. Finally a constitution was prepared, and was promulgated 11 Feb. 1889. From this time on, honors and new responsibilities came to him in quick succession. He was made count in 1882, in 1883, he became premier of the empire, to which office he was later recalled for directing the diplomacy of the Sino-Japanese war of 1894-5; a few years later he was made marquis. In the war with Russia, his great abilities found adequate exercise, and his services in helping to secure the peace of Portsmouth earned him, in 1907, the title of prince. In 1909, he became president of the privy council. It was in performing the duties of this office that he visited Harbin, Manchuria, for a conference with the Russian minister of finance, where he was assassinated by a Korean sympathizer.

Ivins, William Mills, lawyer; b. Monmouth County, N. J., 22 April 1851. His education was received at Adelphi Academy, Brooklyn, and Columbia College. In 1873 he was admitted to the bar and became a member of the firm now known as Ivins, Mason, Wolf & Hoquet. His public service began in 1883, when he became a member of the New York Board of Education, an office which he held with marked acceptance until 1888. He was chamberlain of New York City, 1885-89; judge advocate general of the State of New York, 1886-88; counsel to the Senate Committee on Cities, 1890-91; Republican candidate for Mayor of New York City, 1905; special counsel to the Public Service Commission, First District, 1907; chairman of the New York Charter Commission, 1907-08. His is a life full of service to the community, and his sound and conservative advice on political and municipal affairs is much sought after and valued.

Ivory Coast. Since 1883 a French Possession; situated in Western Africa, between the British Gold Coast and Liberia. The area is approximately 130,000 square miles, and the population 1,000,000, of whom 700 are Europeans. The Ivory Coast forms a part of the French West Africa Protectorate, and is indirectly governed by the Governor-General of the colony, and directly under the administration of a Lieutenant-Governor, residing at Bingerville. The local government finances its affairs from the local revenue, and is not under obligations to defray general expenses. In 1907 there were 29 official schools with 575 pupils; besides four private schools with about 65 pupils. The agricultural products are chiefly,—maize, bananas, plantains, pineapples, and other fruits. Some coffee, coconuts, and rubber are produced. The forest-products consist of various woods, mahogany being worked. Gold is found in some localities, the production for 1906 being

ITALY



1 The Piazzetta, Venice

2 The Rialto, Venice

JACKSON—JACOBS ON DESCENDANTS

valued at about \$2,350. Grand Bassam, Assinie, Grand Lahou, Abidjan, and Bonduku, with other towns, are trade-centres. The imports in 1908-09 amounted to the value of \$2,844,640, and the exports to \$2,165,820. The most important port in the colony is Grand Bassam. Nearly 1,200 vessels annually enter and clear at the ports, which are visited by

the vessels of French, German, Belgian, and British shipping companies. There are about 200 miles of railway open and under construction. Work is being done on the port of Little Bassam, and on a railway at that place. Telegraph and telephone lines in the colony, 1,840 and 420 miles respectively, are the means of communication between the principal towns.

JACKSON, John Brinckerhoff, diplomat. b. Newark, N. J., 19 Aug 1862. After graduating from the United States Naval Academy, in 1883, he went on a two years' cruise, part of the time acting as junior aide to the commander-in-chief of the European squadron. In 1885, he was commissioned ensign of the United States Navy. A special course of training at the Torpedo Station, Newport, R. I., fitted him for an assignment at the Ordnance Proving Grounds, Annapolis—a position which he filled for a short time, resigning, 1 July 1886, in order to prepare himself for a legal and diplomatic career. After admission to the bar, in 1889, he was appointed, 30 Dec 1890, second secretary of the United States legation at Berlin, holding this post until 15 Nov 1894, when he became secretary of the embassy and thereafter frequently acted as chargé d'affaires. He was offered and had accepted the mission to Chile, but, before he could make arrangements to go, this appointment was suspended, in 1902, by that of Ambassador extraordinary and minister plenipotentiary of the United States to Greece, Rumania and Servia, and, in 1903, diplomatic agent in Bulgaria; 21 Sept 1904, he represented the United States at the Coronation of King Peter of Servia. In 1907, he went to Persia, and, early in 1910, to Cuba, as Ambassador extraordinary and minister plenipotentiary of the United States.

Jackson Statue. A bronze statue of "Stonewall" Jackson was unveiled on 27 Sept. 1910, on the State Capitol grounds, Charleston, W. Va., by the local Daughters of the Confederacy, Gen. Bennet H. Young, of Louisville, Ky., Commander of the Department of Tennessee, UCV, was the chief speaker. The statue represents General Jackson with one hand on his sword and the other grasping his field glasses. It is the first statue to be erected in the West Virginia capital, and is 20 feet high.

Jacobi, Abraham, American physician. b. Hartum, Germany, 6 May 1830. He was educated at the gymnasium of Minden and at the universities of Greifswald 1847-48, Göttingen 1848-49, and Bonn 1849-51, receiving the degree of M.D. from the last named in 1851. He received the honorary degree of LL.D. from the University of Michigan in 1898; from Columbia in 1900; Yale in 1905, and from Harvard in 1906. He joined in the German revolutionary movement, and was imprisoned for treason in Berlin and Cologne, 1851-53. Upon his release, he went to Manchester, Eng., and thence to New York City, where he established himself in practice. He was professor of the diseases of children in the New York Medical College, 1860-65; and in the medical department of the university of the City of New York,

1865-92, and was elected professor emeritus in 1902. Doctor Jacobi was a physician to Bellevue, Mt. Sinai, German, and Roosevelt hospitals. He is the author of 'Contributions to Midwifery and diseases of Women and Children' (with Doctor Noeggerath, 1859), 'Dentition and its Derangements' (1862), 'The Raising and Education of Abandoned Children in Europe' (1870); 'Infant Diet' (1872 and 1875); 'Diphtheria' (1876), 'Treatise on Diphtheria' (1880); 'Pathology of the Thymus Gland' (1889); 'Therapeutics of Infancy and Childhood' (1896, 1898 and 1903), 'Intestinal Diseases and Collectanea Jacobi' (8 vols 1909). On 26 Feb. 1910, the board of directors of Mount Sinai Hospital commemorated the 50th anniversary of Doctor Jacobi's connection with that institution and his services to medical science in New York City, placed a life-size bronze bust of the physician in the main hall of the building, and in addition to this permanent memorial, a gold medal, designed by Mowbray Clark was presented to him by the hospital alumni association.

Jacobson Descendants. The descendants of Mr and Mrs. Adolph Jacobson, of Brooklyn, N. Y., to the number of 67, decided (1910) to organize an association for their mutual benefit, socially and financially. An application was filed in Albany for a charter for "The Descendants of A. and L. Jacobson." The primary objects of the organization are to keep the family together, provide funds for needy members, and supply means of social enjoyment at all times. The association is a close corporation, for none but direct descendants of the head of the family and the wives or husbands of direct descendants will be allowed to join.

The plans of the organizers include the establishment of death and sick benefit funds, the formation of sewing circles and card circles, and eventually the founding of some business financed by the general fund, the profits of which are to be divided among the members of the society. The main object at first will be to give assurance that no member of the family of Jacobson shall suffer from want, the aims being subordinate considerations. One of the odd features of the organization is a board of arbitration, which will settle all disputes between members.

Not only will the common fund provide for payments to members in case of death or illness, but it will be used to insure their homes from loss by fire. Thus the "Descendants of A. and L. Jacobson" will undertake to carry on the business of fire, life, and accident insurance as well as that of a mutual aid society.

Adolph Jacobson, the head of the family, is a retired hat manufacturer. The originator of the incorporation idea is Bernard Jacobson, son of the head of the family.

He turned the matter over in his mind and finally sent out a circular letter to each of the other 64 descendants outlining his plan and asking all of them to meet at his home. Forty persons responded. Mr Jacobson outlined his plans in detail, and they were received with enthusiasm. A temporary fund was subscribed and officers elected. The charter members were 67 in number. Besides Mr. and Mrs. Adolph Jacobson, there were six of their children, the husbands and wives of three children, 39 grandchildren, with the husbands and wives of many of these, and 14 great-grandchildren.

It was decided that the officers should be chosen from the oldest unmarried grandchildren. As soon as one of the officers marries, his place will be taken by an unmarried descendant. Harry Jacobson, the oldest unmarried son of Leon Jacobson, was chosen the first president. The vice-president was Julius Biederman; the secretary, Benjamin Jacobson, and the treasurer, Harry Jacobson.

Jade. This beautiful stone has been used for making ornaments from time immemorial, in the Orient, where it is chiefly found. It is sometimes called axstone, and is a hard, tough silicate, of a green, blue or flesh color, sometimes shading to white or translucent tints. The largest jade collection in this country and one of the finest in the world was lately presented to the Metropolitan Museum of Art, New York, where it occupies an entire room. The collection includes carvings from India and China, of every quality and tint of jade, and comprising ornaments, dishes, bric-a-brac, figures of native gods, vases, cups, and in fact everything which could be made of the stone to suit the fancy of royal or wealthy masters. Owing to its hardness the cutting of jade is a process requiring all the patience of Eastern workmen, but when finished the article is highly polished, and to the careless eye resembles glass.

This mineral was much used in the Middle Ages by Oriental kings for their table service. Tavernier, the jeweler who visited the Great Mogul in the 17th century, describes the jade cup from which that monarch drank. The usual color of jade so used is a bluish green, like a sea-wave or the inner leaf of a lily, and in fine specimens of jade cups the color is clear and uniform throughout. The beauty of these cups is ordinarily in their exquisite shape and in the perfection of the limited amount of carving upon them, but occasionally one finds a jade dish with elaborate ornamentation of fret-work or twisted handles. Among the most extraordinary of the exhibits in this collection, from the point of view of ingenious workmanship, are the baskets and bouquets of fruit and flowers carved in jade of varying colors. Some of these are so delicate as to resemble the finest Venetian glass, and the quaint beauty of the flowers has the realistic quality common to Chinese art. In these, as in some of the statuettes, advantage has been cunningly taken of the different shades in the stone, and carving following the lines of natural color in such a way as to appear to the casual eye as if the stone had been colored to suit the design.

Jade bracelets and rings, and necklaces of jade beads of every shade from deep green to the palest hues, are also to be found in

this collection. Jade bracelets contrast beautifully with those of gold or silver, and harmonize with the glass bracelets worn by East Indian women, and these rings of emerald or sea-green stone have always been in high favor in India, as anklets and arm-bracelets. The stone, however, is rarely combined with any other mineral, its beauty being greater when used alone. It does not need a setting of gold or silver, the stones of uniform color being large enough to allow the whole ornament to be carved out of a single piece, and in this it is unique among semi-precious minerals.

Jade is the general name of two minerals now known as nephrite and jadeite. The former belongs to the proxine group, is a silicate of is a silicate of magnesia and lime. Its hardness is 6.5 and specific gravity from 2.9 to 3.0. Jadeite belongs to the proxine group, is a silicate of alumina and soda, its hardness being 7.00; its specific gravity 3.3 to 3.4. A variety of jadeite known as chloromelanite has the same hardness, but owing to the presence of a larger percentage of iron its specific gravity is greater (3.4 to 4.0), and it is a very dark green, almost black color.

The color of jade depends on the contained portion of iron and manganese oxides. It is generally of a more or less uniform shade of green (lettuce, cabbage, apple, emerald, spinach, olive, etc.), but many tones of white are found (especially in Chinese jade), sometimes varied or tinted with undefined patches of green, heliotrope, etc. When cut and polished some of the specimens exhibit considerable translucency and some are very sonorous when struck.

Nephrite is found in the K'unlun mountains in Chinese Turkestan and in the rivers of Khotan which rise in these mountains; in the Sjan mountains of Siberia near the Mongolian frontier; in New Zealand; in the arsenopyrite mines of Reichenstein, near Breslau, Silesia; near Jordansmuhl, Silesia; and in the Jade mountain of Alaska (3,500 ft.), long known to the natives, discovered by Lieut. G. M. Stoney, U. S. N., in 1882-86, 150 miles inland, and north of the Kowak river. Jadeite is found in northern Burma. No jadeite occurs on the North American continent yet the prehistoric jade remains of Mexico, Guatemala, Guiana, etc. are jadeite. This led Professor Fischer of Freiburg, Baden, to the conclusion that they must have come from Burma, and an interesting ethnological controversy has been the result.

Jadlowker, Herman, Russian operatic singer b. Riga, Russia, in 1878. He developed a talent for music, and studied the violin until he was 16 years of age, when he decided to become a singer, and obtained a position in the choir of a Jewish synagogue, and gave violin lessons to earn his expenses. His talent was recognized by his singing teacher who lent him the necessary money to pursue his studies, and he went to Vienna, where he sang in the Church of St. Augustine, and at private receptions. In 1898 he made his first appearance in grand opera, in Cologne, as Lionel in 'The Huguenots' and later sang in the opera houses in Stettin and Riga. He was appointed special entertainer to the Grand Duke of Baden in Karlsruhe, where he was heard by Emperor William of Germany, and at the Emperor's request he was engaged to sing at the Imperial Opera in Berlin for a term of five years. In 1910 he came to the United

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States having been engaged by the Metropolitan Opera Company to create the rôle of the King's Son in Humperdinck's 'Königskinder' the opera was produced at the Metropolitan Opera House, New York City, in Dec. 1910, and his voice and interpretation of the rôle received enthusiastic applause.

Jamaica. One of the British West Indian Islands.

Area and Population.—Jamaica, exclusive of the Turks and Caicos Islands and other near-by British islands, has an area of about 4,200 square miles. The population is estimated at 862,422 for 1910. In the 1891 census, there were 14,700 whites, 610,600 colored and blacks, about 10,000 East Indians, and 500 Chinese. Kingston, the capital, had 46,542 inhabitants before the earthquake of Jan 1907, which destroyed the city. Spanish Town has 5,000 inhabitants; Montego Bay, 4,800; Savanna-la-Mar, 2,950, and Falmouth, 2,500.

Government and History.—The affairs of government are administered by a Governor and two Councils. The Governor is President of the Councils which have a total of 29 members; 14 being elected, 10 nominated, and 5 ex-officio. Elected members serve five years. Fifteen parishes are locally administered by popularly elected boards. The British secured actual control of Jamaica by the Treaty of Madrid in 1670. The institution of a Representative Council was a failure in the middle of the 19th century, and after five years experiment was abolished, being substituted by the Legislative Council, in 1884.

Education, Religion, and Justice.—Endowments and government grants support most of the educational institutions in Jamaica. Public primary schools numbered, in 1908-09, 690 with a total enrollment of about 85,150. There were 80 high-schools, three Government training-colleges for ladies and one for men, pupils totaling 130, besides secondary, high, and industrial schools. The government appropriation toward education in 1908-09 was about \$233,800. Various religions are represented in the Island, and although there is no State church, the Church of England has the greatest number of adherents. There are 35 Roman Catholic church buildings, 235 Episcopalian. Every parish in Jamaica is under the judicial administration of a magistrate. There are circuit courts in the Island, and a high court of justice. About 1,400 individuals were incarcerated at the end of March 1909. Convictions before the superior courts for 1908-09 numbered 8,130. There were 12,630 minor offenders in the same year.

Finance, Banks, and Commerce.—The revenue in 1909-10 amounted to about \$4,964,885, and the expense of the Government was \$5,180,510. Customs provided \$2,203,350 of the receipts. The Jamaican public debt amounted in 1909 to approximately \$18,571,250. Deposits in the Government Savings Bank at the end of 1909 aggregated \$1,903,150, to the credit of about 39,450 accounts. The Bank of Nova Scotia has a branch in the Island, and issues notes. British money is the legal currency, but United States coinage is not prohibited. The agricultural resources of the country are principally sugar-cane, coffee, bananas, tobacco, coconuts, corn, cocoa, ground provisions, and Guinea grass. More than 600,000 acres of

land is devoted to pasturage. Imports into Jamaica in 1909 were valued at about \$12,808,370. Cotton was imported to the value of approximately \$1,744,000, fish, \$918,000, flour, \$1,228,250, and rice, \$253,000. Jamaican exports for 1909 were principally as follows: bananas, (approximately) \$5,093,500, rum, \$910,650; spices, \$700,150; coffee, \$580,000, sugar, \$385,000, wood, \$380,000, and oranges, \$192,000. The total exports for the year amounted to \$13,141,530.

Shipping, Railways, Posts and Telegraphs.—Total registered shipping of the Capital in 1908-09, 39 vessels, tonnage 2,220. There are about 185 miles of railway line in Jamaica. The receipts and expenses for 1908-09 amounted respectively to \$702,850 and \$490,600. There are 900 miles of telegraph, and 430 miles of telephone line. Telegraph receipts in 1908-09 aggregated about \$31,000. The receipts of the postoffice in 1908-09 amounted to \$198,850, and the expenditures to \$176,850. Letters and postcards received and dispatched numbered 8,429,000.

James, William, American psychologist and philosopher: b. 11 Jan 1842; d. 26 Aug 1910. Professor James was educated in England, returning to America in the early Sixties, and entering the Lawrence Scientific School. In 1865, he went to Brazil, with the Agassiz expedition, taking special interest in plants and fishes. On his return, however, he turned to medicine, and took his degree of M.D. in 1870. Two years later—in 1872—became instructor in comparative anatomy and physiology; then assistant professor. He retained this until 1880. From 1880 to 1885 he was assistant professor of philosophy; from 1885 to 1889 professor of the same department. He was professor of psychology from 1889 to 1897, and professor of philosophy from 1897 to 1907. He founded the first psychological laboratory in America, in Harvard, where he taught. He was president of the American Psychological Association and of the International Society for Psychical Research. The honorary degrees of Ph.D. and Litt.D. were bestowed upon Professor James in Padua in 1893, LL.D. Princeton, in 1896, by Edinburgh in 1902, and by Harvard in 1905. He was Gifford Lecturer on natural religion at the University of Edinburgh from 1899 to 1901, corresponding member of the Institute of France; of the Royal Prussian Academy of Science, and of the National Academy of Sciences. Professor James was a voluminous writer. He contributed largely to magazines upon various topics, and was the author, also, of 'The Principles of Psychology', (1890); 'Psychology Briefer Course', (1892); 'Talks to Teachers of Psychology', (1898); 'Human Immortality', (1899); 'The Varieties of Religious Experience', (1902); 'Pragmatism', (1907); 'A Pluralistic Universe', (1908); 'The Meaning of Truth', (1909); 'The Literary Remains of Henry James', etc., etc. He was the founder and the chief defender of Pragmatism in America. He was also the 'discoverer' of Mrs. Piper, and for many years took an active interest in psychical research.

Japan. Japan is an Empire consisting of a group of islands off the northeastern coast of Asia, there being the five principal islands of Honshie, Kiushiu, Shikoku, Hokkaido or Yezo,

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and Taiwan (Formosa), besides numerous minor islands and the southern half of Saghalin.

The long seclusion of Japan, and the high civilization reached by her people in the course of centuries of isolation, have created in the Japanese a unique race, whose possibilities are far from being as yet fully understood by the Western world, especially as, in the trading ports, the average foreigner does not have an opportunity to come in contact with the higher types of Japanese. The view taken by Lafcadio Hearn, whose books present almost the only really comprehensive or intimate account of the Japanese yet published in English, is that Japan has during the last 50 years been trying on the ideas and customs of the Occident, assimilating what she found useful and discarding the rest. In many respects, the standards and impulses of the Japanese are radically opposite to our own, and it is therefore hazardous to assume that Japan will act, in any circumstances, as a nation of European antecedents would act. The misconceptions arising from such assumptions in the past have been partly responsible for the astonishment with which some recent Japanese developments have been received by the Western world. It is not safe to assume that the surface view of Japan is at all the correct one, or that the adaptability of the Japanese indicates a radical change in their national character. Japan has been called the England of the Orient, and in the provinces, which are in the main untouched by the irruption of Western ideas, there are many phases of the life of the people which remind the observant traveller of medieval England. On the other hand, the basic principles of Japanese political, commercial and social life are radically different from anything in Europe. Under the perfect politeness and amiability of Japanese manners there is something of the dangerous virility of the Malay. A cause of some comparisons of Japanese and Chinese character, disadvantageous to the former, lies in the fact that for many centuries military life in Japan has been highly honored, and trade despised, while in China the reverse is true. The natural result of this Japanese standard has been the abandonment of commerce to lower and less desirable types of the population, and as the merchants are the point of contact with the outer world, some very unpleasant impressions of Japanese honor and honesty have been created. Moreover, in some of the countries where Japanese have migrated they have not found the nations guided by very high standards of honor in their dealings with foreigners, and have simply used their wits to cheat in order, as they conceived, to avoid being cheated. Japan is an overcrowded country, and her great need just at present is room to expand, by means of colonies. What the outcome of this expansion movement may be, it is difficult to predict.

Area and Population.—The total population of the islands, excluding natives of Formosa and the Pescadores, was in 1908 (31 December) 49,581,928, with an annual increase of 1.57 per cent. Honshiu (mainland) had in that year a population of 428 per square mile. The population and area of the principal islands was then as follows:

Island	Area square mile	Population	Per square mile
Honshiu (central)	36,600	19,003,457	519
Honshiu (northern)	30,204	7,480,380	248
Honshiu (western)	20,681	10,929,304	428
Shikoku	7,031	3,288,290	468
Kyushiu	16,840	7,748,402	460
Hokkaido	36,299	1,132,095	31
Total	147,655	49,581,928	av 336

It will be seen by a reference to the statistics on England that the population of Japan is greater than that of the United Kingdom by nearly 8,000,000, while her area is but 8,000 miles greater, and the population per square mile in all but one of the islands is greater than that of England and Wales, nearly equal to that of Holland, and greater than it is anywhere in the United States. Moreover, England has immense colonial territories which receive her overflow, while Japan has practically none, and instead of the density of population being confined to the cities it spreads over practically the whole kingdom. Even China cannot parallel this unique state of congestion.

The division of the population in 1909 was as follows: Imperial family, 67, kwazoku, or nobles, 5,642; shizoku, or knights, 2,218,623; the rest are common people, including the Ainu in Hokkaido. There were 326,161 Japanese residing abroad, of whom 219,106 were in the United States or colonies thereof, 98,001 in Korea, 4,940 in Russia or colonies thereof, and 4,114 in the British Empire. The number of foreigners in Japan, exclusive of Formosa, was 17,893, of whom 10,847 were Chinese, 2,401 English, 1,684 Americans, and the rest of various European nationalities. Japan has 35 cities of between 30,000 and 50,000 population; 20 of between 50,000 and 100,000; and 10 exceeding 100,000, viz.: Tokio, 2,186,070; Osaka, 1,226,590; Kioto, 442,462; Yokohama, 391,303; Nagoya, 378,231; Kobe, 378,197; Nagasaki, 176,480; Hiroshima, 142,763; Kanazawa, 110,994; and Kuré, 100,679.

Government.—By the constitution of 11 Feb. 1889, the Emperor combines in himself the rights of sovereignty, and exercises the whole of the executive powers with the advice and assistance of the Cabinet Ministers, responsible to him and appointed by him. There is also a Privy Council consulted by the Emperor on important matters of State. The Emperor exercises the legislative power with the consent of the Imperial Diet, which consists of two Houses, a House of Peers and a House of Representatives. The House of Peers includes members of the nobility and a limited number of other members nominated by the Emperor for special services, or elected by the people. The members of the House of Representatives number 379, a certain number returned from each electoral district, the proportion being about one to 127,000. The Cabinet consists of the Prime Minister and Minister of Finance, and Ministers of Foreign Affairs, Interior, War, Marine, Justice, Education, Agriculture and Commerce, and Communications.

The agreement between the United Kingdom and Japan, 12 Aug. 1905, has for its purposes the maintenance of peace in Asia, the preservation of the integrity of China, and the Open Door, and the maintenance of the terri-

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torial rights and defence of the special interests of Great Britain and Japan in Asia. The agreement is for 10 years, but is not to terminate then without denunciation, a year beforehand, by one or the other of the Powers signing it. If at the date of expiration either Power is at war, the agreement holds until peace is declared.

Local government has as its units municipality, town, and village, and Japan is, except Hokkaido and Taiwan, divided into prefectures. Prefecture, county, municipal, town, and village assemblies carry on the local government. Hokkaido has a governor and a special organization, and Taiwan has a governor-general invested with extensive powers.

Finance—The budget estimates for the year ending 31 March 1911, were total ordinary revenue \$273,637,130, including \$24,331,650 extraordinary revenue; total ordinary expenditure, \$273,500,000; extraordinary, \$59,726,000. The total public debt in 1910 was \$1,359,933,000. The debt, considering the resources of the country, is a heavy one, and one reason why it is held that the world in general need not fear aggressive war measures on the part of Japan lies in the poverty of the government. The people have not yet recovered from the extraordinary burden of the war with Russia.

Army—See ARMIES OF THE WORLD.

Navy—See NAVIES OF THE WORLD.

Education and Religion—Elementary education is compulsory. In 1908 the number of children of school age was 8,183,413. The students and pupils in 27,125 elementary schools numbered 5,713,698, under 122,038 teachers. Tokio University has 321 professors and teachers, 14 of whom are foreigners, and 5,411 students; Kioto University 179 professors and teachers, including 5 foreigners, and 1,412 students; Tohoku University has 63 professors and teachers, including 2 foreigners, and 694 students. The bulk of the other schools are supported by the Government as well as by local taxes. There are 5,382 special and technical schools with nearly 300,000 pupils, and 387 kindergartens with a teaching staff of 1,071, and 35,374 pupils. There are 151 libraries in Japan with 1,616,401 volumes, and 29,109 books and 2,300 periodicals were published in 1908. Formosa has a special educational system.

Religious freedom is absolute. There is no State religion or State support, but the population is divided between Shintoism and Buddhism. There were, in 1907, 78,140 Shinto priests, and 72,062 Buddhist temples, with 120,184 bonze. There were also some 176,740 shrines dedicated to the eminent ancestors of the Imperial House, and others, independent of any religious sect. Of Roman Catholic, Greek, and Protestant churches there were 1,808 clergy and 1,160 churches and preaching stations.

Agriculture—About three-fifths of the arable land is cultivated by peasant proprietors and the rest by tenants. The principal crops are rice, wheat, barley, rye, tea, sugar, and silk. The crop of rice is much the largest, being in 1908 51,032,831 koku (1 koku equals 4.96 bushels) from 2,992,973 chô (1 chô equals 2.4507 acres). In the same year 449,478 chô yielded 4,412,445 koku of wheat; 644,164 chô yielded 9,443,817 koku of barley; 688,659 chô

yielded 7,578,604 koku of rye; of tea, 7,409,974 kwan (1 kwan equals 8.28 pounds avoirdupois) were produced, and of silk cocoons 3,530,171 koku; raw silk 3,518,342 kwan. The number of cattle was 1,237,161; horses, 1,495,252; sheep, 2,949; goats, 80,901; swine 317,640. Fishing is rather an important industry, but no statistics are available. The Buddhist population does not eat meat in any form, but fish, whether dried, preserved in oil, or fresh, is an important part of Japanese diet. Fruit is also cultivated to a considerable extent and brought to a high degree of perfection. Rice, in all Japanese households, takes the place occupied by bread in Europe.

Exports and Imports—The chief exports and imports were in 1908 as follows: Imports in year. Rice, 22,701,321; Soy beans, 10,984,340; sugar, 19,626,641; raw cotton, 8,766,690; cotton shirtings, 9,798,762; wool, 6,850,177; oil cake, 24,544,687; petroleum, 15,920,714; iron and steel, 3,852,825; engines and boilers, 37,339,675. Exports in year. cotton yarn, 20,723,904; cotton shirtings, 6,167,354; raw silk, 108,609,152; silk waste, 7,872,465; silk manufactures, 34,428,839; coal, 19,164,238; matches, 9,510,838; copper, 21,549,992; tea, 16,721,471.

Most of these estimates include Formosan trade. In 1908 the imports subject to duty amounted to 281,399,648 yen and the duty-free imports 154,857,814. The Customs duties amounted to 50,833,146 yen.

The imports of bullion and specie, gold and silver, in 1908 amounted to \$8,954,995, and exports to \$1,925,545.

Manufactures and Minerals—The chief mineral and metal products are gold, silver, copper, lead, iron, pyrites, antimony, manganese, coal, sulphur, and petroleum. The petroleum industry is being developed in the province of Echigo. At Wakamatsu there is a large Government foundry turning out pig-iron, steel, and rails; and at Nagasaki are important shipbuilding works with the newest machinery.

In 1907 there were 82 cotton mills employing 14,828 men and 61,738 women; other manufactures in that year were, silk to the value of 90,701,894 yen; mixed silk and cotton, 20,329,200 yen; cotton, 102,975,020 yen; hemp, 4,094,548 yen; besides sashes and other articles. Many of the choicest patterns in silk are retained in Japan and are never seen in foreign markets. Real Japanese silk of good quality is very fine and soft and wears almost indefinitely; much of the silk which passes for Japanese in our markets is weighted with metal to give it body and its wearing qualities are thus destroyed. Other manufactures are Japanese paper, European paper, matches, earthenware, lacquered ware, matting, leather and oil.

Some of the failures of foreign agents in Japan are due to the fact that they have not duly considered the habits of the people. An example of this was the endeavor of the first company which undertook to promote the use of gas appliances in Osaka, a city where there are only a few score foreign residents. The goods sent over consisted mainly of gas ranges of the usual height, whereas Japanese cooking is mainly conducted on the floor, and the use of these ranges would necessitate a complete revolution in Japanese housekeeping with no material gain. Moreover the fact that Japan

is an earthquake country needs to be considered. Eventually an agent more shrewd than the others conceived the idea of putting on the market small one-and-two-burner stoves which could be set on the floor, and a Japanese agent devised a gas cooker for rice. The sale of gas appliances has since been extremely good in Osaka.

Communications—Japan has 5,029 miles of railway, 500 of which are owned by the State. This includes Formosa. In 1909 1,49,463,185 passengers and 26,098,459 tons of goods were carried. Many Japanese cities, Tokio especially, are full of canal waterways, but no statistics are available on this point. The total number of letters carried in 1908-09 was 332,507,840. Japan has 7,784 post and telegraph offices and 18,744 miles of telegraph line, and 81,167 miles of telephone wire with 80,223 subscribers.

Social Conditions—In 1899 legislation settled that the minimum amount of prefectural funds for the relief of sufferers from extreme calamity shall be 500,000 yen. The number of convictions for all crimes in 1907 was 69,102. The present system of justice is founded on modern jurisprudence. Judges are irremovable except for causes of crime or discipline.

The salient characteristic of the Japanese upon which all travellers comment is the peculiar sense of beauty inherent even in the poorest people. All the details of ordinary living have a grace which is unknown in countries far richer. In sending home a parcel the merchant uses a quaintly decorated paper, or a wooden box made of the wood of a tree which grows very rapidly in Japan, and finished with an artistic care which makes it a thing of beauty. The folklore of Japan permeates all the ideas of the people, and even so small a matter as the arrangement of flowers in a vase follows certain classical rules which have a symbolic significance. The details of modern invention are made to contribute to this picturesqueness. In a pageant where falling water was to be represented, scraps of metal, otherwise worthless, were so placed and lighted as to create a perfect illusion. A wealthy merchant in some Japanese city will show a guest, as the most precious possession of his estate, a quaintly gnarled and twisted old tree, and will explain that this tree did not reach its present outline fortuitously, but through the care of successive generations of his ancestors for 400 years. Such a civilization as this obviously contains so many phases remote from Western life and thought, and deeply rooted in the very nature of the people, that its development cannot be foretold by any foreigner without the most careful observation, extending through a period of years, and embracing the remoter as well as the more apparent characteristics of Japanese life.

History, 1910—The discovery of a plot to assassinate Emperor Mutsuhito, during Nov. 1910, was followed by the trial of 25 men and one woman as anarchist conspirators under the leadership of Denjiro Kotoku, a Japanese who had travelled in the United States, and there, it is said, imbibed socialistic and anarchistic ideas. The punishment for such conspiracy in Japan is death, although the assassination may not actually have been attempted. The great significance of this plot

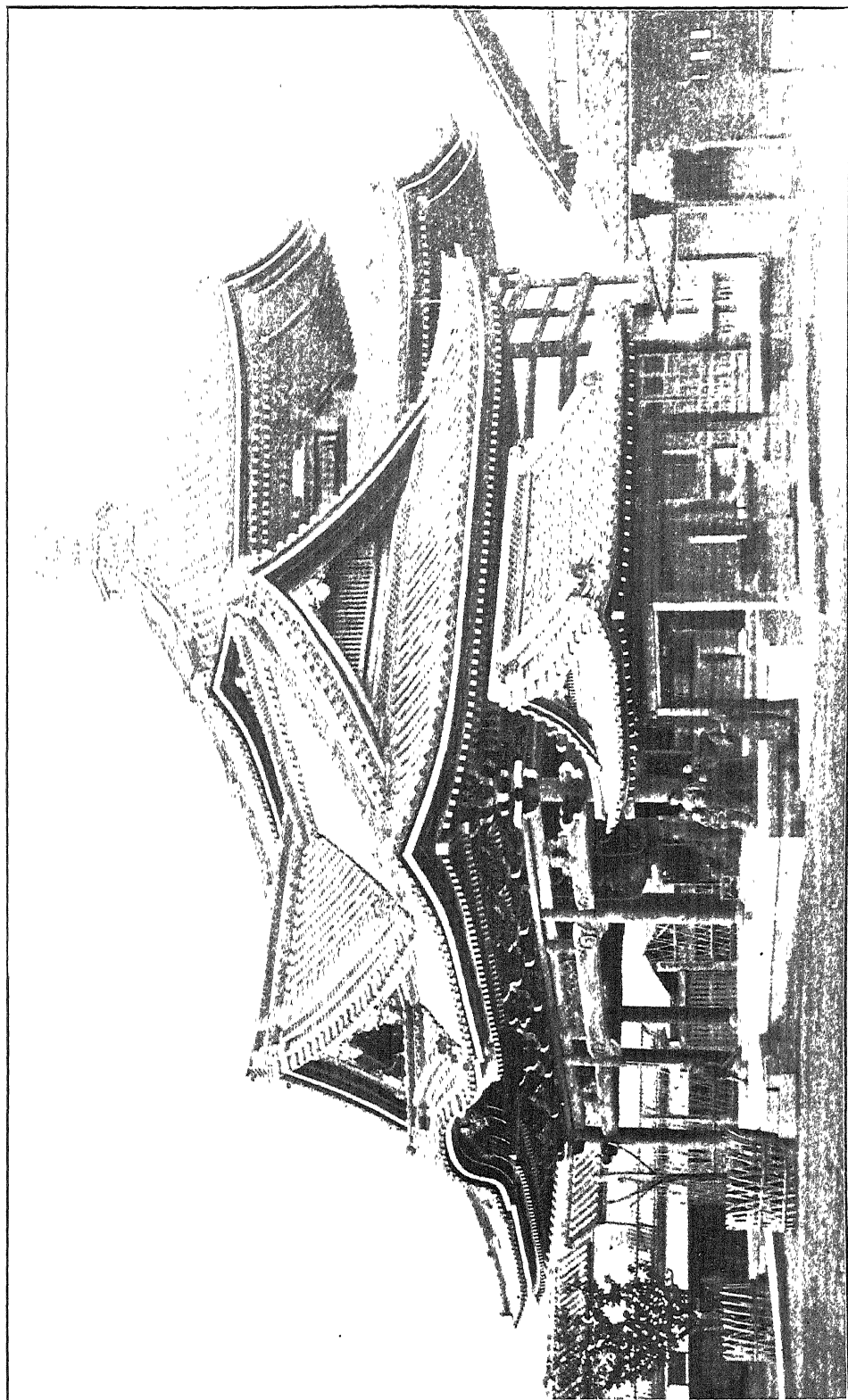
lies in the fact that it is the first for which a trial has ever taken place in Japan. To the mind of the average Japanese the idea of attempting the sacred life of the ruler is unthinkable. Japanese thought, moreover, holds blamable a continued hatred, even if no inimical act be committed, and Japanese mysticism inculcates the idea that such thought may in some cases have a physical effect upon the person hated. The Japanese carries to a logical conclusion the saying of Buddhist theology, "When a wrong is done you, and you do not resent it, then so much evil dies in the world." All this is to be taken into account in viewing the treatment of the plotters against the Emperor. To Japanese ideas, they have committed a capital crime in merely plotting.

It is said by close observers of Japanese affairs that the universal horror excited by the discovery of this plot is likely to bring about a reaction in favor of native tradition and faith, as against Occidental influence. Not enough emphasis has been placed, by many foreigners who have written of Japanese development, upon the fact that the adoption of Western customs and ideas by the Japanese has been to a large extent merely commercial, and so arranged as to enable Japan to cope on more equal terms with the inroads of Western commerce. It is held by those intimately acquainted with the native Japanese that this plot will be considered an indication of what Western ideas produce when carried too far, and so will cause a great revulsion of feeling. This is the more likely from the fact that the whole matter of the arrest and trial of the conspirators was carried on quietly, so that the news will reach the people by word of mouth for the most part. Both England and Germany provide for the trial of such conspirators in much the same way that they were tried in Japan; the difference lies in the attitude of the Japanese mind toward the crime itself, and the unanimity of the horror with which it is regarded.

A change, however, has taken place in Japanese life which is deeper than the surface adoption of Western innovations. There is a disposition among the young men of Japan to-day to be producers, not fighters, and the distaste for army life is rather marked. Old-fashioned Japanese lay this to the effeminate bringing up of the youth of to-day, but there are two other causes which probably have something to do with it. One is that Japan has had two wars lately, and the more eager spirits may have been killed off. The other is that the commercial expansion of Japan has taken a great many adventurous youths to other countries, and given scope for their energies in productive pursuits. Commercial agencies are now talked of, to investigate commercial conditions, and Japanese agents are likely to be placed at New York, London, Hamburg, and Shanghai. They will make their headquarters at the consulates and be subject to the same regulations as the consular officers, but act independently of them. An evidence of this movement is the advent of a tea commissioner in Ottawa to find out why the Japanese tea trade with Canada has been falling off.

The peculiar civilization of Japan has made it, up to recent years, the home of village and

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HECTAGONAL TEMPLE, KIOTO.

home industries Every village has its specialty—a peculiar sort of wood inlay, a white enamel work done with powdered egg-shells, a little ornamental owl made of the thistles by the wayside A child of six or seven will be set to embroider satin, the pattern being stamped, but his fancy allowed to guide the work. The people are happy in working, and in making their work perfect Now this perfection of skill and this artistic sense is likely to be generalised by a daring and skill in trade such as the Japanese brain has shown in war. Japanese tradesmen have already made themselves felt in the United States, and are cordially hated on the Pacific coast in consequence. Japan, with her characteristic sagacity, has forestalled a possible exclusion law on the part of the American Congress, by beginning in the latter part of 1910 to enforce an exclusion act of her own accord. No new emigrants have been permitted to leave Japan for the United States, not even for purposes of study. Statistics show that more Japanese are returning home than are coming to America The Foreign Office will not issue passports to students without a money guarantee sufficient to cover the entire length of their course.

Financially Japan is crippled by the cost of two wars Count Okuma recently called attention to the fact that the national debt is about \$75,000,000, and that the Katsura Ministry has had no better luck than its predecessor in the effort to establish a sinking fund This in itself is reason enough why there is no likelihood of any war between Japan and the United States. Japan's battles for awhile will be commercial Expansion is her imperative need. It was common talk in the restaurants before the war with Russia that Japan must have the Philippines sooner or later.

The total increase in naval expenditure for 1910 was less than \$5,000,000 The new warship, the *Kawachi*, built in Japan, was launched 20 Oct 1910 She is a ship of 20,800 tons, 480 feet long, 48 feet beam, 28 feet deep, with ten 10-inch, ten 6-inch, twelve 4-inch guns and 5 torpedo tubes Efforts have been made within a year to secure a loan from the United States for the increase of the navy, this being merely to follow the lines of other Powers and maintain peace in the Orient When the Diet was opened on 23 December the speech from the throne emphasized the necessity of peace. The contract for a new warship has been placed with Great Britain.

The United States lost 43 per cent of her trade with Japan in 1910, while Asia gained 27 per cent, and Europe 15. One development of recent years has been in the line of fruit culture, and many Japanese fruits are now sold in the United States and elsewhere Those eaten in Japan include pears, sand pears, oranges, apples, date plums, loquats, quinces, pomegranates, peaches, apricots, plums, jujube, cherries, grapes, figs, and gooseberries.

Another enterprise to which Japan is bending every energy is the early completion of the Manchurian railway. Japanese are now hard at work on a railway bridge across the Yalu, and with the completion of this, the Korean and Manchurian systems will be practically one. The actual distance between Antung and Mukden is 189 miles, but hitherto the journey has occupied two days. When the line is converted

into the standard gauge the journey is expected to average not more than 10 hours. For the time being the road will be single-track, and the rough estimate of 25,000,000 yen for the work is based upon this The building of the road, which lies through a mountainous country, involves the boring of some 30 long tunnels, the longest nearly a mile in length. At Dairen the Japanese seem to be endeavoring to run a model city on European lines It has an electric car service, and one of its features is what is known as an "electric park" or amusement park somewhat on the line of the Dreamlands of American cities. The whole enterprise indicates that Japan is strengthening as fast as possible her hold on Korea and South Manchuria.

Japanese Memorial. A bronze tablet to commemorate the Hudson-Fulton celebration was presented to New York City by a committee of Japanese residents. At the time of the celebration the Japanese residents proposed to present to the city 2,100 cherry trees from their native land, the number being arrived at by multiplying the 300 years which the celebration commemorated by seven, the fortunate number. When the trees arrived however it was discovered that they were infected with a botanical disease and had to be destroyed. The Japanese decided to replace the gift, and now have under special cultivation in the Royal Botanical Gardens, at Tokio, a number of young cherry trees which will be sent to this country probably in the Spring of 1912 As an earnest of the gift, in the meantime, the bronze tablet was wrought in the National Art School of Tokio. It displays Grant's Tomb with some of the cherry trees surrounding it. It also bears an inscription signaling the gift of the cherry trees and signed by Hokichi Midzuro (Japanese Consul General), Jokichi Takamine, Rioichiro Aria, Daijiro Ushikubo, Kekusaburo Fukui The cherry trees are likely to be planted along Riverside Drive, a few being also placed about the lawns surrounding Grant's Tomb, in accordance with the view of that monument on the tablet.

Java. Dutch territory in the East Indies The area is about 50,550 square miles (the island of Madura included), and the population (1905) 30,098,000. There are 3 important towns. Batavia, 138,550 inhabitants, Soerabaya, 150,200; and Samarang, 96,600 inhabitants. This the most important of the Dutch East Indian possessions, is administratively divided into 17 districts under as many local Residents, each assisted by minor (native) officials. The district governors exercise absolute authority over their provinces, and are only amenable to the Governor-General of the Protectorate. Receipts from the sale of agricultural articles constitute the greater part of the colony's revenue. The army and navy consume one-quarter of the government appropriation Christians number 26,000 in Java, schools 890, with 74,500 pupils (1907) The Government owns most of the property. What private property there is, Chinese and Europeans control. There were more than 11,467,500 acres cultivated in 1908. Rice was grown on 5,385,150 acres; cotton, maize, arachis, and various plants on 5,346,670; sugar-cane on 355,300; tobacco on 344,875; etc. The production of tea in 1908 amounted to over 22,989,000 pounds; cacao, to more than

JEMISON STATUE—JEWS

2,764,000 pounds; and indigo (1906) to more than 578,000 pounds Tobacco was raised on 145 plantations in Java during 1907 and aggregated about 75,942,500 pounds. Railway lines in Java at the end of 1907 extended 1,350 miles. The Government controls the Bank of Java, which has a capital of about \$2,400,000 Other Netherlands Banks and a few English branch-banks, exist. The savings banks had deposits in 1907 amounting to \$7,290,500, to the credit of 71,270 persons Dutch money, weights, and measures are used exclusively.

Jemison Statue. A bronze statue commemorating Mary Jemison, the "white woman of the Genesee" was dedicated at Letchworth Park, Portage, N. Y., on 10 Oct. 1910. The statue, which is the work of Henry K. Bush-Brown, was the gift of Dr. William Pryor Letchworth, and represents Mary Jemison in Indian garb, with her babe on her back, as she arrived at the Genesee from the Ohio. Mary Jemison, or "Oeh-he-wamis," was captured in 1755 on the frontier near what is now Gettysburg, Pa., by the Indians. According to Indian custom she was adopted by a Seneca family to take the place of a member of the family who had been killed in a battle with the English troops when George Washington was in command of the British campaigns against the Indians. She was married to a Seneca Indian while she was still a girl, and, with her child on her back, tramped to the Genesee River with her foster relatives. For the rest of her life, following her capture, she lived among the Indians finally dying at the advanced age of 91. At one time she was an extensive land owner along the Genesee River, with which her name has always been connected in history. She was first buried in the mission burying ground near Buffalo, but subsequently, owing to the threatened desecration of the grave by the advance of modern improvements, her body was removed to the Council House grounds in Letchworth Park. These grounds are part of the 1,000-acre estate embracing the famous Portage Falls and gorge which was recently presented to the State of New York by Doctor Letchworth.

Jersey City, N. J. According to the 1910 census, the 19th city, having a population of 267,779 with an area of 12 square miles and 203 miles of streets of which 126 2-3 are paved. The public debt is \$13,513,607 and the annual cost of the city government, \$3,041,756. The assessed value of the real estate is \$225,213,354 and the tax rate 19.80. Jersey City spends \$1,050,450 on her public schools, which have 36,119 pupils and 805 teachers and principals. The city has 211 2-3 miles of water mains and 126½ miles of sewers.

Jewish Historical Society, American. The 18th annual meeting of this society was held in New York, 21-22 Feb. 1910. A large number of original contributions to the field of American Jewish history were presented and new officers were elected. During 1910 Publication No. 19 of the society's series was issued and distributed. A publication fund was secured, designed in the first instance to make possible the publication of the valuable collection of documents, MSS., and other historical data collected throughout a period of many years by the late Rev. J. J. Lyons, of the local Portuguese synagogue. •

Jews. Between 28 Nov. and 8 Dec. 1910, a meeting of Jewish scholars, who are engaged upon the preparation of a new English translation of the Hebrew Scriptures, was held at the Jewish Theological Seminary in New York. This meeting was the result of a movement which began in 1892 on the initiative of the Jewish Publication Society of America. The plan for the translation was prepared by a committee in 1893, the committee being Dr. Morris Jastrow, Sr., chairman, Judge Mayer Sulzberger, Dr. Benjamin Szold, Dr. K. Kohler, and Dr. Cyrus Adler. By 1895 the work had been organized, with Dr. Morris Jastrow as editor. The books of the Bible were distributed among a number of Jewish scholars for translation. Five years were consumed in the work, which had to be carried on largely by correspondence and finally it was decided to issue the Book of Psalms, which was done into English by Doctor Kohler. This volume was published in 1903 and was favorably received. Ten years were spent, resulting in the production of one book. However, many of the translations of the other books were handed in in the meantime and the revising editors were busy discussing disputed points. None of the remaining books had been made ready for publication when Doctor Jastrow died in 1903. Attempts at reorganization were undertaken without definite results, until in 1907 negotiations were undertaken between the Jewish Publication Society of America and the Central Conference of American Rabbis, looking to plans which would bring the work to a conclusion. A board was formed consisting of seven men; three representing the publication society chosen by its publication committee, and three representing the Central Conference of American Rabbis. Prof. Max L. Margolis, as editor-in-chief, prepared a translation in accordance with the plan agreed upon—that the translation should incorporate the best results of biblical scholarships of all ages, including commentaries ancient and modern, the various versions prepared by Jews or under the influence of Jews, the manuscript translations handed in to the publication society, with a particular regard to the work of standard Jewish expounders of the Bible. The work of the present board of editors has been carried on by meetings, about three a year, generally of 10 days each, from 1908 until the present time. It is estimated that it will require meetings lasting two years longer for the work of revision.

The modern history of the Jews may be said to begin with Moses Mendelssohn's famous translation of the Pentateuch into German in the 18th century. Since that day Jewish scholars have translated the Bible into the languages of their countries. All these Jewish translations have been the work of individual scholars. The version in general use among English speaking Jews is the English translation of Isaac Leeser of Philadelphia (1806-08). The present movement is the first effort in modern days among Jews to produce a translation of the Bible by a body of scholars, representative of Jewish learning among English speaking Jews. The new version will follow the order of the books as given in the Hebrew Bible. In making the version a specially Jewish one, the translators had to keep close to the Bible as actually used in the Synagogue. The text of the Hebrew Scriptures was fixed by the labors of a school

JEWS

of grammarians known as massorites, because they summed up and fixed in the vowels and accents of the text, the results of Jewish tradition as to its meaning. The editors of the new version have invariably followed this text, which is the only authorized Hebrew text of the Bible.

The movement among the Jews for a revival of the real language of the fathers in place of Yiddish has resulted in the establishment of a school in New York for the study of Hebrew. The school first opened in Dec. 1910, at the headquarters of the Young Men's Hebrew Association, 600 public school children, 11 to 13 years of age being enrolled.

In Dec. 1910, news came to America of an order by the Czar confirming the resolution of the Russian cabinet to permit Jewish merchants of the First Guild to reside in the city and province of Moscow. The Emperor Nicholas, on 1 November, approved the opening up of new sections for the Jews. Heretofore their legal residence had been restricted to that section of the Polish provinces and the Ukraine, known as "The Pale." The action of the Government in opening up 12 new districts resulted from the petitions of the inhabitants of the newly opened localities who desired the admission of Jewish residents as a means of improving local business conditions. This order revoked the official list published in May which included less than 200 Jewish merchants of the First Guild whose families were legally entitled to live in Moscow. According to the estimate at the time several hundred others came within the order of expulsion.

Hebrew scrolls containing the Laws of Moses and the Ten Commandments arrived in New York in Dec. 1910, direct from the Zionist headquarters in Jerusalem, the Jews of the city marking the occasion by parades and speechmaking. The scrolls were made specially for the New York society by the organization in Jerusalem; and the presentation of such parchments to any of the subsidiary organizations throughout the world is regarded as a great honor.

According to the *Univers Israélite* the total number of Jews in the world is 11,817,783. Of this total 8,942,266 are in Europe, 1,894,409 in America, 522,635 in Asia, 341,876 in Africa, and 17,106 in Oceania. Of the European Jews, 5,110,548 are in Russia, 1,224,899 in Austria, 851,378 in Hungary, 607,862 in Roumania, 238,275 in England, 105,988 in Holland, 52,115 in Italy, 33,663 in Bulgaria, 15,000 in Belgium, and 12,264 in Switzerland. New York has the biggest Jewish population of all the cities of the world. It is given at 1,062,000. The Jewish population of other cities is given in the following order: Warsaw, 254,712 (35.8 per cent of the population); Budapest, 186,047 (23.5 per cent of the population); Vienna 146,926 (8.8 per cent of the population); London 144,300 (2.1 per cent of the population); Odessa, 138,935 (34.4 per cent of the population); Berlin, 98,893 (4.8 per cent of the population); Lodz, 98,671 (31.4 per cent of the population); Chicago, 80,000; Salonica, 75,000; Philadelphia, 75,000; Paris, 70,000; Constantinople, 65,000; Vilna, 63,841 (41.3 per cent of the population); Amsterdam, 59,065 (11.5 per cent of the population); Jerusalem, 53,000 (66.2 per cent of the population); Kishineff, 50,237 (46.3 per cent of the population); Minsk, 45,000; Limberg, 44,258 (27.6 per cent of the pop-

ulation); and Bucharest 40,533 (14.7 per cent of the population). The following is a summary of the conditions of the Jewish people in foreign countries.

In Russia—On 1 Feb. 1907, the Jews in Odessa were attacked by a reactionary body known as the Union of Genuine Russians. During the riot that followed, more than 50 Jews were seriously injured. Trouble continued during the entire year. In 1908 a reaction took place in Russia, characterized by the loss of ground by liberalism and the control but not suppression of the revolutionists. The question of the advisability of Jews as recruits for the Russian army was early in the year dissipated by the evidence that 54,276 Jews were at that time enlisted and faithfully serving the Russian government. Questions in connection with the Jews was the occasion of much discussion in the Duma, although the Constitutional Democrats protested against the debating of such matter. The question of denationalizing the Jews, after the manner of Rumania, was seriously considered by Russian leaders. The order of M. Stolypin, expelling Jews from the Polytechnic Institute at Kiev, was the cause of certain professors of the institute resigning. The chief seat of persecutions against the Jews during 1908 was at Odessa. In 1909 events were less strained. Persecution of the Jews were in the shape of orders of expulsion with the exception of several attacks—one by peasants in Tiraspol where a family of 12 Jews were murdered. Artisans of the Jewish faith were excluded from residing in the capitals of provinces which are not within the "Pale of Settlement." The first congress of communal workers and representatives of the communities in the Pale was held at Kovno in 1909. The creation by the government of a committee on Jewish religious education in secondary schools; the strict enforcement of the law limiting the Jewish high school students to 10 per cent of the total; and the proscription of the Yiddish drama added to the burdens of the people. It was estimated that 130,000 Jews in southwestern Russia had no educational provision. A bill, guaranteeing freedom of conscience, was passed by the Duma.

In Rumania—In March 1907, following agrarian troubles, the Jews were victims of outrages from peasants in various places, extending as far as the crown lands in Bukowina, Austria. Ten thousand Jews were reported homeless and fugitive, 22 March, and 28 March, at the recommendation of the American Jewish Committee, the National Committee for the relief of the victims from Russian massacres appropriated \$135,000 to assist the victims of the disorders in Rumania. The Jews who sent a deputation to the Prefect of the Jassy District, on 12 April, were advised by him to emigrate, as he was powerless to protect them. In 1908 the government kept up its determined and persistent campaign of Jewish expulsion inaugurated in March of the preceding year. The expulsion decrees affected 10,000 Jews. Thousands were ruined by the new law forbidding "aliens" to engage in the wine business. The employment of more than one-third of the Jews in industrial shops was forbidden, even when owned by Jews. In 1909 the year closed without any disturbances of a serious nature. The enforcement of the taking by the Jews of the distasteful oath *more*

JEW—JOGUES MEMORIAL

judaisico, required by the local courts of justice, and the prohibition of Jews from repairing school houses by the Mayor of Jassy, are among other things which transpired

In Austria-Hungary—In view of the near approach of the introduction of universal suffrage, 6 Jan 1907, a number of Jews resolved to start a Jewish provincial organization, in assembly at Samberg, Galicia for the defense of the political rights and economic interests of the Jews. The Austro-Hungarian minister at Bucharest, 8 November, protested against the action of the Rumanian government in sending expelled Jews into Austria and Hungary. The Jewish Committee in Vienna, through its executive committee, commemorated the 60th jubilee of the Emperor by a contribution towards the building of an orphan asylum for boys, of 100,000 kronen. In 1908, four Jewish members of the Austrian Reichsrath formed a Jewish club, to consider all Jewish questions. At the convention of the General Jewish Union held the last of April, 150 delegates representing 90 congresses formed a national organization. In 1909 the government created a department to handle the religious interests of the Jews. An important action was the decision of the Hungarian Minister of Education to only recognize communities of Jews who have at their head a rabbi

In France—The Jewish Consistory of Paris 12 March, 1907, declined the innovation suggested by the Liberal Union, to modifying the traditional service in one of the Paris synagogues. The request embodied Service Sunday mornings; prayer in French and Hebrew, sermon in French either by a rabbi or layman, selected by the Liberal Union. The last day of 1907 was notable in Jewish affairs by the establishment in Paris of a reformed synagogue. On 6 April 1908, Rabbi Alfred Leni was made the successor of the late Zadoc Kahn as Grand Rabbin in France. In 1909 the Jewish Consistory of Paris voted to admit to membership foreign Jews who had lived 10 years in France. The membership of the Consistory numbers 3,666. In June, at a conference of French Rabbis held at Paris, various changes in the ritual were suggested, principally the adoption of the triennial cycle for reading the law

In Germany—The year 1907 was notable for the large numbers of Jews who emigrated from Germany. Not a Jew was left in many towns. Hilfsverein der Deutschen Juden carried on a successful work, increasing its membership to 18,000 scattered over 500 cities and towns in Germany. The year 1909 was also favorable to Jewish progress in Germany. By the decision of the Bavarian government no reference was made to the faith of the holder in the passports for Russian travelers. At Strassburg a new museum of Jewish ceremonial objects was opened, and in the suburb of Berlin an institution for the education of Jewish defectives

In Morocco—In Aug. 1907, 6,000 Jews in Mallah were attacked by the Arab tribes, following a bombardment of the town by a French battleship, during the revolt of the Kabyles. Thirty Jews were killed, 60 wounded, and 250 women and girls were carried off. More than half the Jewish population fled to Tangier, Gibraltar and neighboring places in destitution. The town of Setlat, in November, was attacked and sacked by Arabs, the Jews fleeing for their lives.

The Jewish village near Sefton was attacked by Berbers and many women and children were stolen. Nearly 500 Jews emigrated to Spain in December. Conditions during 1908-09 changed for the better, after the settlement in favor of the succession of Mulai Hafid. Although the Jews were confined to separate quarters of the towns their legal rights were somewhat respected.

In Turkey—The Sultan, on 30 May 1907, deposed the chief Rabbi of Jerusalem, and replaced him with the candidate of the Orthodox Jews. The Sultan also appointed a commission in December to proceed to Samaria and Macedonia to examine into their economic possibilities. David Wolfson, a German Zionist, was granted an interview by the Sultan with reference to concessions to Jews in Palestine. The important political events of 1908-09 had a salutary effect upon the Jews resident in Turkey. The establishment of a constitutional régime was joyfully welcomed. The kindly feeling of the Young Turks toward the Jews, and the institution of a number of needed reforms by the government beneficial to the foreign population brought great relief. The abrogation of the special tax on Jews with reference to military service, and equal standing with Turks created a much needed reform. In Palestine the year 1909 was significant by the establishment of the Jewish colony *Ain Ganim*, and the completion of the Heisl Memorial Forest. On 1 May 1909, the announcement was promulgated that the Ottoman government intended to abolish all restrictions on Jewish immigration, and would confer full rights of citizenship on Jews immediately after their settlement in Palestine.

In England—Many prominent Jewish scholars from all parts of the world attended the International Congress of Religions at Oxford in the fall of 1908. Prof. Paul Haupt, of Baltimore, defended the theory that Jesus was not by race a Jew. Dr. Moses Gaster and others contended that he was. Twelve Jewish schools, with accommodations for 10,902 pupils were found to be the entire accommodations in the United Kingdom for Jewish children. The emergency of the Jews in Rumania was memorialized to the government by the Combined Joint Committee of the Jewish Board of Deputies and the Anglo-Jewish Association at the time when it was believed that the Berlin Treaty was to be revised after the progress in the Balkan. A memorable meeting of the Jewish Religious Union through reports brought out the condition of Liberal Judaism in France and Germany. Sunday closing bills in the House of Commons aiming to deprive the Jew of his economic privileges were defeated.

Jogues Memorial. A movement was begun during 1910 under the auspices of the New York Historical Association with a view to erecting a permanent and fitting memorial to Father Isaac Jogues, S. J., at Lake George, N. Y. The martyred priest was New York State's first Christian missionary and it is a matter of regret that his heroic end has been so long allowed to go without a concrete mark of appreciation. A Committee has been appointed to formally arrange for this, and subscriptions toward the furthering of the project are now coming in. It is believed that the most appropriate form of memorial would be a bronze tablet or bust, set in some rocky niche on one of the islands of the lake.

JOHNSON—JONES

Johnson, Charles Fletcher, United States senator b in Winslow, Maine, a little town on the Kennebec River, 14 Feb 1849, of old New England ancestry. He was educated by his father up to his 12th year, and then entered Bowdoin College, working his way by teaching school in the winter months. He was graduated from Bowdoin A B 1879, A M 1882, and for a while he was a railroad clerk but deciding on the law as a profession he studied privately while teaching school. He was principal of the high school at Machias, Maine, for five years, and in 1886 was admitted to the bar and established himself in practice in Waterville, Maine, as a partner of S. S. Brown, 1886-91, with Edwin F. Webb, 1891-98; and in 1909 took Carroll N. Perkins as a partner. He was attorney for the Maine Central Railway, the Lockwood Cotton Mills, Hollingsworth and Whitney Pulp and Paper Co, the Waterville and Fairfield Electric Light Co, and the Waterville and Oakland Street Railway Co. In politics he was a Democrat, and in 1888 when Waterville was organized as a city he was elected City Clerk, City Solicitor and a member of the board of education. He was the unsuccessful candidate for mayor in 1889 and 1891, but was elected to the office in 1903. In 1905 and 1907 he was chosen as representative to the State legislature, and during both terms was leader of the minority. In 1909 he was the unsuccessful candidate for election to the State Senate, but ran considerably ahead of his ticket. He is a 32d degree Mason and prominent in the order in the State, having been Grand Master of the Grand Lodge of Maine 1901-07. He is also a member of the Elks, and A. O. U. W. In Sept 1910 he was elected to the U. S. Senate, to succeed Senator Eugene Hale, and took his seat 4 March 1911. Senator Johnson was the first Democrat to represent his State in the United States Senate since 1847, and the first from any New England State in 30 years.

Johnson, Frederick Foote, assistant missionary P. E. bishop of South Dakota, and 227th in succession in the American episcopate b. Newtown, Vt., 23 April 1866. He spent his early years in his native town and taught in district schools while preparing for college. He matriculated at Trinity College, Hartford, and was graduated with class honors in 1894, receiving the degree of A M in course. This was followed by three years at Berkeley Divinity School, Middletown, Conn., where he graduated B D in 1897. While at Middletown he was private secretary to Bishop Williams. His honorary degrees were D.D. Trinity College, 1906, and a like degree from Berkeley Divinity School the same year. He was ordered deacon 11 November in Trinity Church, Newtown, Conn., and ordained priest 15 Oct 1897 in Denver, Colorado. He had charge of St Barnabas Mission, Glenwood Springs, Colo., 1897; was curate St. Stephen's Church Colorado Springs, 1897-98; rector St John's Church, Boulder, Colo., 1898; Trinity Church, Redlands, Cal., 1899-1904; diocesan missionary Worcester, Mass., 1904-05, and his work as a missionary was notable in that the Union Congregational Church of North Brookfield, Mass., was received into the union with the Protestant Episcopal Church. The transfer of a most beautiful church building and its entire membership was thus transferred from the Congregational Society to the diocese

of Western Massachusetts. He was elected bishop to assist in South Dakota and he was consecrated at his home church, Trinity, Newtown, Conn., 2 Nov 1905. The missionary district in which he is assisting Bishop Hare, who had been alone in the work for 32 years, comprises 80,000 square miles, with 41 clergy, 131 parishes and missions, and a population of about 500,000, made up of white settlers and Indian tribes.

Johnson, Joseph Horsfall, first P. E. bishop of Los Angeles and 179th in succession in the American episcopate. b. Schenectady, N. Y., 7 June 1847. He was graduated from Williams College A B 1870, and from the General Theological Seminary New York City, in 1873, was ordered deacon the same year and ordained priest in 1870. He was pastor in charge of Holy Trinity Church, Highland, N. Y., 1873-79; rector of Trinity Church, Bristol, R. I., 1879-81; St. Peter's, Westchester, N. Y., 1881-86, and of Christ Church, Detroit, 1886-96. The honorary degree of D D was conferred on him by Nashotah College, Wisconsin, in 1895 and that of S.T.D. by the General Theological Seminary in 1908. On 24 Feb 1896, he was ordained 1st bishop of the diocese of Los Angeles, his consecrators being the bishops of Michigan, Nebraska, and Wyoming and Idaho. This diocese had been organized in 1895 and comprised the counties of Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, Orange, San Diego, and Imperial, and had a population of 304,211. Bishop Johnson took up his episcopal residence in Pasadena.

Johnson Memorial. The old residence of Dr Samuel Johnson in Gough Square, Fleet street, London, which was for a long time on the market for sale was purchased late in the year 1910 by a gentleman who intends to present it to the English nation. Old engravings seem to indicate that the house has undergone only slight change since the days when it was occupied by the great lexicographer. It is the hope of the man who has acquired the place to gather together all the personal relics of Doctor Johnson obtainable, put the house as nearly as possible into its original shape, and support it as a permanent memorial to the man who occupied it so long ago. The same thing has been done to the residences of other famous dead literary men, and it seems fitting that such a great writer as Doctor Johnson should have some such memorial to his memory.

Johore. A British possession; one of the Confederated Malay States, in the Malay Peninsula. Johore occupies the southernmost portion of the peninsula and has an area of about 9,000 square miles. The population was last estimated at 200,000, nearly all Malay and Chinese. The chief town is only 15 miles from Singapore. The Government of the colony is in the hands of a Sultan, who carries out the administration through native functionaries. The revenue accrues, principally, from duties on imports and exports. The former consist chiefly of opium, beverages, tobacco, rice, hardware, etc.; the latter of tea, coffee, sago, pepper, gambier, and gutta percha. Strait Settlements money is in circulation; the "dollar" being worth about 60 cents. Johore has been under British rule since 1885.

Jones, Henry Arthur, English dramatic author: b. Grandborough Bucks, Eng., 28 Sept.

JORDAN—JUVENILE COURT

1851. He was educated at Winslow, Bucks, and later devoted his efforts chiefly to the drama. Is the author of many plays, produced both in England and America. Among the most prominent of these are 'A Clerical Error' (1879); 'Silver King' (1882); 'Saints and Sinners' (1884); 'Middleman' (1889); 'Judah' (1890); 'The Dancing Girl' (1891); 'Crusaders' (1891); 'The Bauble Shop' (1893); 'The Tempter' (1893); 'The Masqueraders' (1894); 'The Case of Rebellious Susan' (1894); 'The Triumph of the Philistines' (1895); 'Michael and his Lost Angel' (1896); 'The Rogues Comedy' (1896); 'The Physician' (1897); 'The Liars' (1897); 'The Manoeuvres of Jane' (1898); 'Carnac Sahib' (1899); 'The Lackeys Carnival' (Mrs Danes Defence' (1900); 'The Princesses' Nose' (1902); 'The Idol' (1902); 'Whitewashing Julia' (1903); 'Joseph Entangled' (1904); 'The Chevalier' (1904); 'The Heroic Stubbs' (1906); 'The Hypocrites' (1906); and 'The Evangelist' (1907). The Honorary degree of A.M. was conferred on him by Harvard University in 1907. In 1910 Mr. Jones came to America to lecture on the drama before the leading American Universities, and at the same time to supervise the New York production of his latest play.

Jordan, David Starr, American educator. b. Gainesville, N. Y., 19 Jan 1851. He worked his way through college and was graduated from Cornell University A. B. 1872 and from Indiana Medical College 1875. He was instructor in the botanical laboratory, Cornell 1871-1872; professor of Natural History, Lombard University, 1872-73; principal Appleton Collegiate Institute, Wisconsin, 1873-74, student and lecturer on marine botany, Anderson School, Pemkese Island, Mass, 1874; lecturer on zoology, Harvard Summer School, Cumberland Gap, 1875; professor Natural History, Butler University, Indiana, 1875-1879; professor of biology, Indiana University, 1879-85; president Indiana University 1885-91, and President of Leland Stanford, Jr., University from 1891. He was president of the California Academy of Sciences 1896-98 and again 1900-04 and since 1908; president American Association of Arts and Sciences 1909-10; assistant to United States Commission 1861-91, 1894-1909. He received the degree of Ph.D. from Butler University in 1877; that of LL.D. from Cornell in 1886; Johns Hopkins, 1902; Illinois College, 1905; Indiana University 1909. He attended the International Zoological Congress at Gratz, Austria, in 1910, and lectured in Berlin on Humanity and War; investigated in Paris the progress of the world peace movement in connection with the International School of Peace incorporated in 1910 in the United States; and conferred with peace-workers in Belgium and England. At Tufts College he said "Future war is impossible because the nations cannot afford it." In Europe he said "The war debt is \$26,000,000,000, all owed to the Unseen Vampire, which the nations will never pay and which taxes poor people \$95,000,000 a year." His latest books include 'The Call of the Twentieth Century' (1905); 'The Human Harvest' (1907); 'Evolution and Animal Life' (with V. L. Kellogg) (1907); 'Life's Enthusiasms' (1907); 'College and the Man' (1907); 'The Higher Sacrifice' (1908); 'The Religion of a Sensible American' (1909); 'The Stability of

Truth' (1909); 'The Fate of Icnodoram' (1909).

Jordan, William George, American editor, author, and publicist. b. New York City, 6 March 1864; educated at the College of the City of New York. Mr Jordan began a particularly active literary career as the editor of *Book Chat*, later accepting the editorship of *Current Literature*, which he abandoned to embark upon the lecture platform, elucidating a new theory of education which he called Mental Training by Analysis, Law and Analogy. On retiring from the lecture field Mr Jordan became editor of the *Ladies' Home Journal* and subsequently of the *Saturday Evening Post*, which position he occupied until 1899 when he became vice-president of the Continental Publishing Company. In 1905 he instituted and edited the *Searchlight*, which he gave up a year later to devote himself to the writing of books. In 1907 he came into particular public attention when he evolved the idea of the House of Governors. This suggestion was probably the most notable of all his many achievements and it was directly responsible for the call by President Roosevelt of a convention of Governors at Washington, D. C., in 1908. At this meeting a committee was appointed to arrange for permanent organization, and in January 1910 the House of Governors (q.v.) came into official existence and held its first meeting. The scope and aim of the organization is almost identical with that originally outlined by Mr Jordan in his first suggestion, and in recognition of his work in this connection Mr. Jordan has been elected secretary of the association. Mr Jordan is the author of the following works: 'Mental Training A Remedy for Education' (1896); 'The Kingship of Self Control' (1899); 'The Majesty of Calmness' (1900); 'The Power of Truth' (1902); 'The House of Governors' (1907); 'The Crown of Individuality' (1909); and 'Little Problems of Married Life' (1910).

Junior Republics. See **GEORGE JUNIOR REPUBLIC.**

Juvenile Court, The. A court for the separate arraignment and trial of juniors under the age of 16, charged with any crime or misdemeanor. It is often called "the court of one more chance." Before the day of the Juvenile Court, children were often arrested for petty offenses and sent to jail or fined or both, and often when a fine was unpaid it had to be worked out in jail. Young people were often locked up in the same cells with the most depraved adult prisoners. All dependent, delinquent and neglected children under 16 come under the provision of the juvenile court law. A delinquent child was formerly construed to mean any child under 16 violating any State law, or village or city ordinance. But the Illinois law of 1901 extended this class to include children associating with thieves or immoral persons; growing up in idleness; frequenting houses of ill-fame; knowingly patronizing policy shops; also incorrigibles. The Colorado law of 1903 enlarges the scope of the term to include children visiting saloons, poolrooms or bucket shops; night wanderers; strollers about railroad yards; children jumping on moving trains; also those conducting themselves immorally around schoolhouses and using obscene language. The States that have adopted juvenile

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court laws or juvenile probation laws have followed Illinois in the main in giving to the terms delinquent the same meaning. The Colorado law is the most inclusive in scope as to delinquents.

The juvenile court movement, which had its origin with the enactment of the Illinois law in 1899, has aroused extraordinary interest and has made very rapid progress. It is a reform that has gone around the world, for not only have France, England, and Germany established children's courts, but Japan has also become interested in the subject and has sent a special delegate to New York City to study methods for the reformation of the child. Massachusetts is entitled to the honor of being the first State to enact laws for the separate trial, probation, and protection of juvenile offenders, some of the enactments dating as far back as 1866. Rhode Island in 1898, the year before the legislation in Illinois, passed some excellent laws regarding the trial and disposition of youthful offenders.

The incident which started the investigation in Rhode Island was the case of two boys which came up before the Grand Jury in the fall of 1896. The legal charge against these two boys, who were about 12 years of age, was for "breaking and entering." They had climbed through an open window at the rear of a fruit store and had taken 37 cents and a ticket to the circus. For this crime they had been confined in jail from June until September, awaiting indictment by the Grand Jury, before they could be tried for the offense. Through the endeavors of a member of this grand jury a measure relating to juvenile offenders was prepared for the legislature and passed in May 1898. It provided that a minor under the age of 11 years charged with any crime or misdemeanor should be arraigned and tried apart from the arraignment and trial of other cases. It provided also that an agent of the Board of State Charities, or an agent of the Society for the Prevention of Cruelty to Children, or the agent of the St. Vincent de Paul Society should be present at the arraignment and trial to secure the services of counsel in their behalf, and generally to take care of the interests of said children.

In Massachusetts and Michigan the principle of the probation system was recognized and approved before other States had realized its importance. Pennsylvania and Wisconsin introduced juvenile probation laws and juvenile court laws in 1901; Baltimore, New York City, Cleveland, and Colorado in 1902; California, Indiana, Missouri, New Jersey, New York State and the city of Brooklyn in 1903; Iowa and Ohio in 1904. Georgia, Louisiana, District of Columbia also have juvenile courts.

The widespread interest in this extremely important subject is due in a great measure to the work and writings of Judge Ben. B. Lindsey of Denver, Col. Since 1901 Judge Lindsey has been energetically engaged in the work of helping youthful offenders to reform. The original law under which the juvenile court of Denver was established was enacted in the winter of 1899. The statute was very brief and provided, in substance, that any child under 16, incorrigible or guilty of immoral conduct could be proceeded against in the county court as a disorderly person. In January 1901 a probation system was established. In 1902 a more elaborate juvenile court law was passed. Un-

der the present law a house of detention is provided for; the jail for children under 14 years of age is abolished. When a child is arrested the juvenile court may order that it be sent to the detention house for a limited period. There it must be kept at its desk just as if it were in school and must be taught the common branches. At night the superintendent sleeps in the room with the boys; the matron sleeps in the room with the girls.

The most important feature of Colorado's Children's law is an act declaring that all parents, guardians, or other persons by any act or in any manner causing, encouraging, or contributing to the delinquency of any child, as defined by the statutes of the State shall be guilty of a misdemeanor and punished by a fine not to exceed \$1,000, or imprisonment not to exceed one year, or both. This act holds parents to a rigid responsibility for the misdemeanors of their children. Records show that out of over 100 parents brought to the Juvenile Court of Denver during the first year of the operation of this law, less than 5 per cent failed to obey the orders of the court. A majority of these cases were for truancy and the parents were fined, this process resulted in the children becoming regular in their school attendance.

Another instance of the effect of this important law may be cited. Legally, any child who purchases liquor or who even enters a saloon is deemed a delinquent child. But under this law affecting parents, the father who sent the child to the saloon and the saloon-keeper who gave the child liquor would both be prosecuted for contributing to the delinquency of the child. Another wise provision of the Colorado juvenile laws is that the evidence in any case against the child for delinquency cannot be used in any other proceeding against the child at any other time.

The most effective factor of the Juvenile Court of Denver is what is known as the "Report System." A rule provides that all children found guilty of disorderly conduct shall report to the court once every two weeks, with a statement from the teacher detailing the school attendance and conduct of the child. By an arrangement between the schools and the court, when a child who is on the probation list fails to appear at school the fact is telephoned to the court and a paid probation officer is at once sent out after the child. The court also keeps a watch over the record of the child in school. As a result of the probation system during the first two years of the Juvenile Court in Denver, 554 children, of whom 39 were girls, were placed on probation, being required to report in the manner just described. Of these 554, only 31 boys had to be committed to the industrial school, and a number of these were particularly unfortunate in their home surroundings.

One of the interesting effects of the work in Denver are what are known as "Voluntary Delinquents." These boys are principally brought to court by other boys who have been helped by their own experience with the "Report System." Some of these boys have applied to Judge Lindsey to be placed upon the probation list as a help in breaking themselves of some bad habit to which they had become addicted. Repeated failure to win a "good" re-

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port in school means that the child must go to see Judge Lindsey and must have a talk with him alone. The Judge thus finds out about the child's home life, companions, etc., and often succeeds in personally influencing the boy towards an entire change of behavior. Sometimes it is found that the child must be put under the care of one of the physicians appointed by the court and treated for weak eyes, defective hearing, or other unsuspected disabilities.

In connection with and growing out of the work of the Colorado law are several important associations and activities. Many boys are sent to the sugar beet fields from June to September in camps of about 15 boys, one probation officer and a cook. Most of the boys do well. There is also an employment bureau and a "Needy Children Relieved" department; also a Juvenile Improvement Association which conducts several boy's clubs and summer camps.

The Children's Court of New York City is the largest in the world. It bases its success on the parole system. The fundamental lesson it teaches to the boys and girls who are arraigned before it is the learning to respect the rights of others. The charges run the gamut of the penal code, from the ordinary youthful mischief to burglary and attempts at suicide. By this parole system the culprit is ordered to report every day during his term of parole and is to reappear before the judge on the day set as the termination of the parole; sometimes he is put on parole for a month, sometimes for six months. The punishment for any transgression of the penal code during that time is commitment by the court to an institution. The children's court proceeds on the belief that the home, though far from ideal, is a better place for the child than a reformatory. Frequently the court orders that the parents shall move into a different neighborhood in order that the child may get away from influences and surroundings that are contaminating him.

Records of the Children's Court of New York City show that 85 per cent of these paroled children make such improvement in their conduct that they never have to be committed to an institution. In case commitment is necessary, care is taken to put the children of Catholic parents in an institution of the same religion and Protestant children into Protestant institutions. Inquiry is made into the earning ability of the father of the family, and according to his wage he is ordered to pay something every week towards the support of his child in the institution. This precaution must be taken in order to keep shiftless parents from throwing upon the State the burden of the support of their children. In cases where it is discovered that the offense of the child, such as stealing food or clothing, is due to extreme poverty, an agent of the Charities Organization takes up the case and provides help. The task of presiding over this children's court is

regarded by the magistrates as the most difficult post in the city.

No juvenile court system can be complete unless there is back of it a compulsory school law, a child labor law, an adult delinquent law, and a detention school in place of the jail. It is to the Juvenile Court that the great problem of the State daily comes—the problem of the future citizenship of this country.

Juvenile Crime. See CRIME, JUVENILE.

Juvenile League. An organization, consisting of 150,000 boys and girls, who pledge themselves to aid the Street Cleaning Department in keeping the thoroughfares free of rubbish. The league was founded and is supervised by Reuben S. Simons, whom, though blind, Commissioner Edwards called "the most valuable man in the Street Cleaning Department." The children help to enforce the law. Erring householders are warned by the volunteer aides, and if that warning is not obeyed there is prompt recourse to the law. There are 72 branches of the League in 72 school buildings of the city and the members make regular reports to the Street Cleaning Department. The leagues have been organized in almost every State of the Union, and practically Massachusetts. The idea of the League was suggested one day in 1895 in a conversation Simons had with the then street cleaning commissioner. Simons got permission to address the public schools. At first the children thought they were being asked to spy on their neighbors, but when that misapprehension was removed they became enthusiasts. The work of the organization was carried on in the settlement houses, but when one of the settlement workers was asked to resign in 1892 by Commissioner McCartney the settlement houses were closed against the junior street cleaners. "I had then no places to hold my meetings except on the streets and in the parks," states Mr. Simons, "so I held them there. Many a time our enthusiastic crowds of children were made to move on by policemen. Finally, with the commissioner's consent, I secured rooms at 261 East 4th street for \$22 a month, which I paid out of my own pocket. In 12 months after we reopened our quarters we had 44 leagues in running order, and a membership of 4,000 children. The work went on until permanent headquarters were secured in 1898." Successive commissioners were opposed to the League, but Simons kept up the work, till finally Commissioner Foster Crowell in 1908 aided him again in the work of organization. In December of that year Simons had nine leagues in operation, and then W. H. Edwards became street cleaning commissioner. Commissioner Edwards consistently supported the League and the branches gradually grew to 72. The members conduct their regular meetings and make out their own reports in proper form. The work of the organization has given the children an invaluable training in citizenship.

Kaiser Wilhelm's Land. See GERMAN NEW GUINEA.

Kamerun. A German Protectorate in West Africa, situated between the French Congo and British Nigeria. The area is 191,130 square

miles, and the population about 3,000,000, of whom more than 1,100 are whites (and nearly all of these German). The town of Duala has 22,000 inhabitants. Buea is the government-seat. Trading stations are Victoria, Kribi, Rio del Rey, and Campo. Three merchants compose



W R STUBBS,
GOVERNOR OF KANSAS

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a local council in the government, which is chiefly administered by a Governor, a Chancellor, and two Secretaries. Education is promulgated in four government schools, with 550 pupils, and in denominational schools with a total enrollment of 19,000. The administration of justice entailed about 4,400 convictions in 1908-09—100 of which concerned Europeans. The revenue, exclusive of imperial aid, amounted for 1909-10 to about \$1,983,200. The mineral resources of the country are chiefly gold, the agricultural resources, cocoa, coffee, rubber, cola, and oil palms. Cloves, ginger, pepper, vanilla, and other products are being experimentally raised—and successfully. The imports into the colony amounted in 1909 to more than \$4,197,200, and consisted mainly of textiles, spirits, timber, salt, ironwork, and produce. The leading exports for 1908 were: rubber, \$955,950, cocoa, \$530,850; palm kernels, \$440,700; palm oil, \$197,500; and ivory \$180,100, and all exports amounted to \$2,432,700. The exports were valued at \$3,041,000 in 1909. Over 400 vessels entered and cleared at the ports in 1908. There are 320 miles of railway line in the colony, telegraph line is being rapidly installed; a cable connects Kamerun with the Nigerian town of Bonny.

Kansas. A State of the South Atlantic division of the United States with an area of 82,080 square miles, 380 being water. According to the 1910 census, Kansas had a population of 1,690,949, an increase of 220,454 or 150 per cent over 1900. The population per square mile is 207 per cent. Kansas is the 22nd State in point of size. Its capital is Topeka with a population of 43,684.

Agriculture.—According to the statistics for the fiscal year 1910 collected by the Department of Agriculture, the production of corn aggregated 169,100,000 bushels on an acreage of 8,900,000 and was valued at \$76,095,000; winter wheat, 61,060,000 bushels, acreage, 4,300,000, and farm value, \$51,290,000, spring wheat, 1,008,000 bushels, acreage, 120,000, value, \$847,000; oats, 46,620,000 bushels, acreage, 1,400,000, value, \$15,851,000; barley, 5,400,000 bushels, acreage, 300,000 and value, \$2,430,000; rye, 532,000 bushels, acreage, 38,000, and value, \$388,000; buckwheat, 15,000 bushels, acreage, 1,000, value, \$14,000; flaxseed, 410,000 bushels, acreage, 50,000, value, \$861,000; potatoes, 5,016,000 bushels, acreage, 88,000 and value, \$4514,000; hay, 2,061,000 tons, acreage, 1,792,000 and value, \$16,076,000. The farm animals 1 Jan 1910 were: horses, 1,187,000, value, \$127,000,000; mules, 154,000, value, \$17,864,000; milch cows, 737,000; value, \$27,195,000; other cattle, 3,260,000, value, \$77,262,000; sheep, 278,000, value, \$1,307,000; number of sheep of shearing age 1 April 1909, 170,000; average weight of fleece, 7 pounds, percentage of shrinkage 64 pounds; wool, washed and unwashed 1,190,000 pounds; wool scoured 421,400 pounds. The swine on the Kansas farms 1 Jan 1910 numbered 1,942,000, their value being \$19,420,000.

Mining and Manufacturing.—In 1908, the anthracite and bituminous coal production was 5,576,346 as against 6,537,901 for 1907. Six months of warm weather in the latter year and the increased production and consumption of oil and natural gas in Louisiana and elsewhere were causes for this decrease. Kansas has a petroleum area of 200 square miles and 550 of

natural gas, the crude petroleum production amounting to 1,811,781 barrels valued at \$746,695. There were 566 wells completed. The 1908 production of natural gas yielded \$7,691,589. There was a zinc output of 8,628 short tons. In 1908, the output of Portland cement was 3,854,603 barrels valued at \$2,874,457. Salt also to the value of 2,588,814 barrels valued at \$382,084 and clay products valued at \$2,248,805 were also produced. The total mineral outputs for the year was \$26,162,213. The last census report on the subject shows that in manufactures the capital employed is \$88,680,117, the number of wage earners, 35,570, wages paid \$18,883,071 and the value of the products, \$198,244,992. The number of establishments were 2,474 with 2,776 proprietors or firm members, and 3,714 clerks. During the year, \$155,840,449 worth of raw material was used. The capital invested in the slaughtering industry was \$25,332,330 and the output \$66,375,679. Kansas City is the important center of the live stock trade. There was \$13,816,887 in flour and grist industries which yielded \$42,034,019. Zinc smelting is another prominent industry. Its capital was \$10,403,432, output, \$10,149,468.

Government.—The Governor of Kansas is Walter R. Stubbs, Republican, whose salary is \$5,000 a year and whose term expires 10 Jan. 1913. The Lieutenant-Governor is Richard J. Hopkins, the Secretary of State, Charles H. Devine; Treasurer, Mark Tulley; Attorney-General, John S. Dawson; Superintendent of Public Instruction, E. T. Fairchild. The United States Senators are Charles Curtis, whose term expires 1913 and Joseph L. Bristow who serves to 1915, both Republicans. Members of House of Representatives are D. R. Anthony, Jr., A. C. Mitchell, Philip P. Campbell, Frederick S. Jackson, R. R. Reese, I. D. Young, E. H. Madison and Victor Murdock, all Republicans. The composition of the State Legislature is Senate, 35 Republicans, 5 Democrats; house, 71 Republicans, 53 Democrats, 1 Independent.

Finance.—The receipts and disbursements for the year ending 30 June 1909 were: Receipts 1908-09 \$5,934,348 and the disbursements, \$5,302,708. In 1910 the total assessed value of the real and personal property in the State was \$2,752,097,452. The bonded debt, \$520,000. According to the figures furnished by the Comptroller of the Currency to the National Monetary Commission in 1909, Kansas had 204 National Banks with 23,880 depositors and \$6,454,238 60 deposits, 581 State banks with 21,144 depositors and \$5,586,609.85 deposits and 13 savings banks which in 1910 had 18,294 depositors having \$3,507,501.05 deposits. In addition, Kansas has 5 private banks with 165 depositors and \$58,849 35 deposits.

Religion and Education.—According to the last census on the subject there were 1,648 female and 933 male Adventists; 16,412 male and 26,733 female Baptists; 5,402 male and 9,845 female Congregationalists; 14,907 male and 24,074 female Disciples or Christians; 13,398 male and 14,216 female Lutherans; 43,591 male and 72,280 female Methodists, 14,879 male and 23,944 female Presbyterians; 46,026 male and 45,736 female Roman Catholics and 5,776 male and 8,158 female United Brethren sect. There are also many other minor religious denominations. For 1909, the sum of \$7,378,194 was spent on education. There were 392,009

pupils in the schools The male teachers were 2,474 and the female 10,511 High school education is now free in many counties of the State For 1909, the Kansas university, technical schools and colleges had an income of \$1,350,946 of which \$61,000 was derived from the government, \$92,682 from productive funds and \$292,493 from tuition fees The value of their buildings was \$4,130,079 and of productive funds \$1,660,240.

Charities and Corrections—There are 50 benevolent institutions in addition to public ones for the care of the insane and paupers They comprise 23 hospitals, 13 private and 1 public orphan asylum, 9 private and 2 public homes for adults and 2 public institutions for the deaf and blind There is a State board for the control of public charities.

Legislation.—The legislature meets in biennial session and it is limited to 50 days It did not meet in 1910. The 1909 session passed acts reducing commodity rates on railroads, providing for the guaranty of deposits in State banks, prohibiting children under 14 from working in any factory and workshop not owned by their parent and from working in any theatre, packing house, elevator or mills and regulating the hours for all over 16 between 7 a m and 6 p m, providing for government by commission for cities of the first class (over 15,000) and of the second class (over 2,000) and for the initiative and referendum and recall in their charters; requiring hotels and other public buildings to have sufficient fire escapes; prohibiting the sale of intoxicating liquors and cigarettes and limiting the sale of tobacco to adults, requiring persons interested in legislation to register with the Secretary of the State; enforcing the sale of pure food, fixing weights and measures, maximum freight rates; providing for good roads and the supervision of roads by a State Engineer, creating the office of Dairy Commissioner and giving him power to enforce the sale of pure butter, cheese, ice cream, etc., an act for the protection of the people against tuberculosis, for its suppression in cattle and provision also for dissolution of corporations that abuse their privileges

History—During the early part of Sept. 1910, the 54th anniversary of the time when John Brown and his men fought the Missouri guerrillas in the woods at the edge of the town of Osawatimie was celebrated The occasion has since become famous in political history. For it was at Osawatimie that ex-president Theodore Roosevelt delivered his address on the New Nationalism. The Kansas Agricultural College started a course in cooking during the year. More than 500 girls and young women enrolled The pupils are taught to prepare and cook the food in all the different methods of serving the viands. There are also sewing classes where girls may learn how to mend, make patterns for clothes, cut goods to avoid waste, select trimmings and make their own clothing. During 1909, the most important event in the controversy revolving around monopolies was the agreement of the International Harvester Company to the imposition of a \$60,000 fine for violating the Anti-Trust law. The company agrees to submit its business to the public control and permit either the Supreme Court or a public utilities commission to regulate its prices.

Katsura, Marquis Tara, Japanese army officer and statesman b Chosiu, Japan, in 1847 He was educated in the Military School of Prussia and entered the army in 1867 serving throughout the war of the restoration. He was military attaché to the Japanese Legation at Berlin 1875-78 and in 1884 visited Germany and made a study of the German army He was Vice-Minister of the Japanese army 1886-91, and in this capacity achieved the great reform in the army; was commissioned Commander in Chief of the third division of the Japanese Army, and served during the Chino-Japanese War, 1891-95. In 1896 he was chosen governor-general of Formosa He was chief commandant of the Tokio Bay Defense, 1896-98; Minister of War, 1898-1900, and Prime Minister of Japan, 1901-06. He was made an honorary Knight of the Grand Cross of the Bath by King Edward VII in 1905

Keator, Frederick William, fifth missionary P E. bishop of Olympia, and 203d in succession in the American episcopate. b Honesdale, Pa, 22 Oct 1855. He was graduated from Yale University A.B 1880, LL.B. 1882; engaged in the practice of law in Chicago, Ill, 1882-90, but abandoned it to study for the ministry, and was graduated from the Western Theological Seminary, Chicago, in 1891 He was ordered deacon and ordained to the ministry in 1891, and was rector of the Church of the Atonement, Chicago, 1891-96; of Grace Church, Freeport, Ill, 1896-99, and of St John's, Dubuque, Ia, 1899-1902 The honorary degree of S.T.D. was conferred on him by the Western Theological Seminary in 1902 and that of D.D. by Yale University the same year. He was elected fifth bishop of the missionary district of Olympia, as successor to Rt. Rev William Morris Barker, D.D., who died 21 Feb. 1901, and he was consecrated 8 Jan 1902 by Bishops McLaren, Flare, and Nicholson.

Keda. A State under British rule in the western part of the Malay Peninsula; ceded to Great Britain in 1909, by a treaty signed at Bangkok, and annexed to the Straits Settlements (qv) The area is about 3,000 square miles. The population is probably between 150,000 and 200,000, among whom are a considerable number of Chinese. The colony is governed by a native Sultan, but he is counselled by an Advisor, and assisted by a State Council composed of the Advisor and four members. The treasury as well as other departments of the government are in the hands of British officials, with the sanction of the natives. The revenue amounts to about \$665,000 per annum, and the expenditure to \$620,000 Opium farms afford the principal source of revenue. There is a school at Alor Star, the seat of government, situated on the coast. The police of the colony are under British command. There are police and other courts for the administration of justice. Rice, paddy, and tapioca are the chief products of the soil. The forests are being worked and protected, of late, however, and rubber is being cultivated. Tin mines are successfully operated in two or three districts. There is mail and telegraph service in Keda (or Kedah). The capital of the colony has 75 miles of telephone line, and steamers visit that port periodically.

Keiley, Benjamin J., R. C. bishop; b. Petersburg, Va., 13 Oct. 1847. He received his

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theological education at the American College, Rome, Italy, was ordained priest 31 Dec 1873, and was pastor at Wilmington and at New Castle, Del, 1873-96; at Atlanta, Ga, 1886-96; and at Savannah, Ga., 1896-1900. On 3 June 1900 he was consecrated bishop of Savannah as successor to the Rt Rev Thomas Albert Becker who died in 1899.

Kelantan. A district formerly belonging to Siam, in the eastern part of the Malay Peninsula, ceded to Great Britain by an Anglo-Siamese treaty executed at Bangkok, 10 March 1909. The area is 5,000 square miles and the population in excess of 300,000, about 10,000 of whom are Chinese. The capital city has 10,000 inhabitants. A native hereditary ruler is the chief functionary. Under him are district officials, then there are "circle heads," and after that, village principals. The estimated revenue for 1908 was about \$191,800. The British have instituted schools in the colony, in one of which there are 80 pupils. There is a government grant toward education. The religion of the country is chiefly Mohammedanism. The police are British-controlled. There are very few roads in Kelantan, but the boat service upon the rivers and coasts is exceptionally efficient. There is steamer service between Bangkok and Singapore. There is telegraph and telephone communication between Bangkok and other parts. The industries of the country include silk-manufactures, boat-works, and brick-kilns. The leading agricultural products are rice, cocoanuts, betel nuts, tapioca, sugarcane, pepper, and maize. Resin and gharu, bamboo, and rattan are also produced. Good timber is found and worked in the colony. The livestock is a valuable resource, there being about 90,000 cattle, 20,000 buffaloes, and sheep, and goats. Poultry is plentiful. Mineral products are gold, galena, tin, etc. The gold exportation in 1906-07 was valued at \$127,800; galena, \$4,800. British companies are taking hold of the mines of Kelantan. The country's exports amount to about \$692,400 per annum, and the imports to approximately \$833,000.

Kellor, Frances Alice, Chief of the Bureau of Industries and Immigration. b Columbus, Ohio, 20 Oct 1873. Her parents were in moderate circumstances and she attended the public schools of her native city and engaged in journalistic work on the *Coldwater Republican*. She removed to Chicago where she continued in newspaper work. Deciding on the law as a profession she entered Cornell University Law School where she was graduated LLB 1897, and pursued an undergraduate and graduate course at the University of Chicago 1898-1904. She interested herself in the Sociological work from a scientific viewpoint and attended the New York Summer School of Philanthropy in 1901. She made a special study of the criminal in institutions and when the Women's Municipal League undertook the betterment of the condition of the dwellers in the densely populated districts of New York City and established a bureau of Municipal Research, Miss Kellor was largely instrumental in the shaping of its policy, and was elected general director of the Inter-Municipal Research Committee. Statistics were kept of servants and the homes in which they might be employed, and a thorough investigation was made of employment agencies, which caused the closing of many

agencies which sent girls to immoral resorts, and a modification of the rules of many other establishments. Miss Kellor served her directorship without payment, and carried her reform movement to Albany where she obtained legislative action. In the guise of a servant, she lived in the lodging houses of the city, where immigrant girls and unemployed servants found board, and in this manner succeeded in obtaining evidence that resulted in closing the worst of such places. She was a fellow of the College Settlement Association, 1902-04, a member of the Committee of Fourteen; a member of the New York Research Council; a member of the New York State Immigration Commission in 1909; was appointed by Governor Hughes a member of the special commission to investigate labor camps, and it was her report, written in conjunction with Lillian D. Wald of the Nurses Settlement and another of the commission, and published in the survey, describing the conditions in the construction camps, along the new barge canals, and the route of New York's new water system that caused the establishment of the Bureau of Industries and Immigration. On 3 Oct 1910 she was appointed chief investigator of the State Labor Department and placed in temporary charge of the Bureau of Industries and Immigration. A civil-service examination being necessary before she could become the actual head. She competed in the examination and among 31 competitors, 30 of whom were men, she stood highest and was awarded the new position. She assumed her duties in Oct 1910, and contributed her salary of \$2,500 to the appropriation made by the Legislature for the new bureau. Her appointment was confirmed by the State Civil Service Commissioner on 31 Nov. 1910.

Kenny, William John, R. C. bishop: b Delhi, N. Y., 9 Oct 1853. He was graduated in arts from St. Bonaventure's College, Allegany, N. Y., studied for the priesthood, and was ordained at St. Augustine, Fla., 15 Jan. 1879. He was pastor at Jacksonville, 1879-81; Palatka, 1881-84; Jacksonville, 1884-1902; and was appointed vicar-general of the diocese in 1889, serving until 1901, when he was elevated to be administrator of the diocese, as successor to the Rt Rev. John Moore, who died 30 July 1901. He was consecrated third bishop of St. Augustine 18 May 1902.

Kinsman, Frederick Joseph, third P. E. bishop of Delaware, and 239th in succession in the American episcopate: b. Warren, Ohio, 27 Sept. 1868. He was graduated at St. Paul's School, Concord, N. H., in 1887, and went abroad to resume his studies at Oxford, Eng., and was graduated from Keble College, Oxford, A.B. 1894, A.M. 1899. He was ordered deacon in 1895, and served as master of St. Paul's School, 1895-97. In 1896 he was ordained to the priesthood and was appointed rector of St. Martin's Church, New Bedford, Mass., 1897, serving until 1900, when he was elected professor of church history at the Berkley Divinity School, Middletown, Conn. In 1903 he was elected to fill the same professorship at the General Theological Seminary, New York City, and held that chair until his elevation to the bishopric. He was consecrated third bishop of Delaware, 28 Oct 1908, Bishops Tuttle, Whitaker, and Niles officiating. The

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honorary degree of D.D. was conferred on him by Berkeley Divinity School in 1909. Bishop Kinsman is a member of the American Society of Church History, and of the Historical Society of Delaware.

Kentucky. The largest State of the East South Central Division of the United States, having an area of 40,590 square miles, of which 400 are water. According to the 1910 census, its population was 2,289,905. This is a gain of 142,731, or 66 per cent, over 1900. The population per square mile is 57 as against 53.4 in 1900. Kentucky ranks 14th in population. Its capital is Frankfort.

Agriculture.—The corn crop for 1910 was 105,270,000 bushels, its acreage 3,630,000, and its farm value, 1 Dec 1910, \$55,793,000. There were 9,600,000 bushels of winter wheat produced in 1910, its farm value being \$8,928,000, a price per bushel of 93 cents. The acreage aggregated 750,000 and the average yield per acre was 12.8 per cent. The oats crop for 1910 yielded 4,250,000 bushels from an acreage of 170,000, and its farm value on 1 December was \$1,912,000. The production of barley declined in 1910 to 24,000 bushels valued at \$16,000. There were 1,000 acres devoted to it. During 1910, there were 160,000 bushels of rye, grown on 13,000 acres, and valued at \$144,000. The potato production was 3,712,000 bushels, on an acreage of 41,000, and was valued at \$2,399,000. This was a heavy increase over 1908 and 1909. In 1910, Kentucky produced 645,000 tons of hay on an acreage of 500,000, valued at \$8,450,000—a large increase over 1909. There were 470,400 acres devoted to the raising of tobacco in 1910, yielding 381,024,000 pounds, valued at \$33,149,088—nearly double the production of 1908. Kentucky is the largest tobacco-raising State in the Union. Its production is more than twice that of North Carolina and nearly three times that of Virginia. On 1 Jan 1910, the farm animals were as follows: 407,000 horses, valued at \$42,735,000; 207,000 mules, valued at \$24,426,000; 349,000 milch cows, valued at \$12,884,000; 665,000 other kinds of cattle, valued at \$13,234,000. The swine aggregated 989,000, and were valued at \$6,725,000. There were 1,060,000 sheep valued at \$4,240,000. The number of sheep of the shearing age on 1 April 1909 was 750,000, a shrinkage of 39 per cent; the wool washed and unwashed, 3,750,000 pounds, and the wool scoured, 2,287,500 pounds.

Mining and Manufactures.—There are bituminous and canned mines, the output of which is 10,246,500 short tons, valued at about \$10,000,000 per annum. The petroleum yield averages about 725,000 barrels annually, amounting to \$706,801. The fluorspar in 1908 amounted to 6,323 short tons, valued at \$48,642. Kentucky also has sandstone and limestone quarries, the output of which is valued at about \$900,000. Brick, tiles and pottery are turned out to the value of \$2,239,108. Iron, lead, barytes, lime, natural cement, asphalt, natural gas and mineral waters are other mineral products of the State. The value of the mineral output, including pig iron, but not iron ore, for 1908 was \$16,141,956. According to the last census figures, Kentucky has 3,734 manufacturing establishments having a capital of \$147,282,478, giving employment to 59,794 wage earners, their total earnings amounting to \$24,438,634. The cost of the materials used is \$86,545,464 and the value of

the products, including custom work and repairing, \$159,753,968 per annum. In 1909, the distilled spirits produced amounted to 27,524,275 gallons, and the fermented liquors to 704,948 barrels.

Fisheries.—For the fisheries of the State, there are 452 independent fishermen and 103 wage earning fishermen. For the year ending 31 Dec. 1908, 5,389,800 pounds of fish valued at \$110,300 were taken. Of this, 436,100 were catfish valued at \$26,130, 520,600 buffalo of the value of \$21,450, 449,400 German Carp valued at \$17,970; 354,500 drum valued at \$16,120, and 3,413,000 pounds of mussel shells and pearls valued at \$19,750. There was also black bass, breen or sun fish, paddle-fish, sturgeon, and suckers caught.

Government and Finance.—The Governor of Kentucky, Augustus E. Willson, Republican, receives a salary of \$6,500 a year, and his term expires 31 Dec 1911. The Lieutenant-Governor is W. H. Cox; Secretary of State, Ben L. Bruner, Treasurer, Edwin Farley; Auditor, Frank P. James; Attorney-General, James B. Breathitt. Kentucky is represented in the United States Senate by Thomas P. Paynter, Democrat, and William O. Bradley, Republican. Its representatives in the lower house of Congress are Ollie M. James, Augustus O. Stanley, R. Y. Thomas, Jr., Ben Johnson, Swager Sharley, Arthur B. Rouse, James C. Cantrell, Harvey Helm, W. J. Fields, all Democrats, and John W. Langley, and Caleb Powers, Republicans. The State legislature consists of a Senate of 37 members, 24 Democrats, and 13 Republicans, and a House of 74 Democrats and 26 Republicans. For 1909, the balance sheet of the general expenditure fund showed available \$2,696,650 and the cash in the treasury \$336,873. The expenditures were \$4,237,478, showing a deficit of \$1,203,954. The amount spent on schools for 1909 was \$3,081,616.

Religion and Education.—The leading religious denominations are the Baptists, Roman Catholics, Methodists, Disciples of Christ, and Presbyterians. During 1909 there were 739,836 pupils enrolled in the schools, for which 11,027 teachers were employed. Under the constitution the school revenue is derived from the interest on Commonwealth bonds for \$1,327,000, dividends on 708 shares of stock in the Kentucky Bank of the par value of \$79,800, the interest on the 6 per cent bonds of the Commonwealth.

Charities and Corrections.—There is a State Board of Control which supervises the public charitable institutions. During the fiscal year of 1910, \$160,534 was expended for new permanent improvements. There is a movement on foot for a manual training and industrial department at the Kentucky Institution for Feeble-Minded Children. There are 82 benevolent institutions in the State. This does not include insane asylums and almshouses. The majority of these institutions are supported by individuals and ecclesiastical bodies.

Legislation.—The next regular session of the Legislature will take place 1 Jan. 1912. It is biennial and is limited to a session of 60 days. The Kentucky Legislature met accordingly in 1910. Measures were enacted for the distribution of preventive serum in cases of hog cholera and heavily penalizing the owner for failing to report his suspicions as to the presence of the disease, making it lawful for farmers to agree

to abstain from growing any kind of a crop for any given period of season and to continue for the purpose of securing a higher price, extending the child labor law to business offices, telegraph offices, hotels, restaurants, apartments and boarding houses, and prohibiting the employment of children between 14 and 16 years of age without a school certificate; punishing by fine cruelty to animals; substituting the electric chair for hanging in cases of capital punishment; providing for indeterminate sentences, the limit to be fixed by the judge in felonies and the juries in misdemeanor cases, licensing automobiles and providing for the following registration fee. \$5 for a car of less than 25 horse power, \$10 for a car from 25 to 50 horse power and \$20 for a car over 50 horse power. Speed limit, whatever is reasonable and proper "under the circumstances of the time and place," but eight miles an hour on corners and at curves and crossings, 10 miles an hour in business sections, 15 miles in resident sections, and 20 miles elsewhere are *prima facie* unreasonable.

History, 1910.—During the year, the agitation over the liquor question; the controversy between the tobacco growers and the American Tobacco Company, out of which night riding grew and the feuds in Breathitt county have ceased to attract attention. During 1909, Boyd County, having a population of 40,000, voted no license by a majority of 235. This made 96 out of 119 counties "dry" under the county unit law. During the latter part of 1910, the State Court of Appeals declared the election in Powell County, which went "dry," void because the Bible was used as an emblem. There was a picture of an open book on each ballot with the words "Holy Bible" under it. The court held the emblem to be prohibited by statute. The conflict between the combined and independent tobacco growers was echoed in the 1910 Legislature by a measure legalizing the combination. During 1909 an action was begun under the Sherman Law in the Federal Court against the Burley Tobacco Society by Clark and Scott of Scranton to recover \$135,000 damages for conspiracy in trying to control the White Burley tobacco market. The feud in Breathitt County was reechoed in 1910 by the killing of John Abner, a noted feudist, on 23 August. Abner was accused of being one of the men hired by James Hargis to assassinate James B. Marcum and others. A town without officials is being built on the Kentucky side of the Ohio River. It will be run on socialistic lines and the people will rule themselves. Trials for crimes will take place at public meetings in the public hall and the people will vote on the guilt or innocence of the accused.

Kiau-Chau. A German Protectorate on the east coast of China, in the province of Shan-tung. Kiau-Chau is the name applied to the harbor, the city, and the district. The bay is of the same area as the district—200 square miles. The population in 1908 was about 1,484,000, of whom 33,000 were whites. The country was proclaimed a German Protectorate in 1898. The Government is in the hands of navy officers. Government expenditure for 1909-10 was about \$2,470,500. Justice, etc. At Shanghai there is a German consular court. The exercise of justice toward Chinese is

specifically restricted. Europeans have their own judges. Education is dispensed in German Schools for Chinese, and in a school at Tsing-Tau for superior instruction. The chief agricultural products are sweet-potatoes, ground-nuts, fruits, and beans. Silk is cultivated. The industries of the country include silk-weaving, soap-making, coal-mining, briquette-making, and brewing. The leading imports in 1908 were cotton and cotton-goods, cotton yarn, metals, paper, sugar, and matches; and amounted to the value of \$10,216,900. The principal exports were silk, straw braid, the oil of beans and nuts, etc.; and were valued at \$7,821,650. Kiau-Chau has a floating dock employing about 1,000 Chinese. Vessels entered and cleared at the port in 1908, about 470, and more than 6,000 junks entered. There are approximately 230 miles of railway in the colony.

Kidnapping. See BLACK HAND.

Kinsolving, Lucien Lee, first P. E. missionary bishop of Southern Brazil, and the third consecrated in America for foreign churches. b. Loudoun County, Va. 14 May 1862. He attended the Episcopal High School at Alexandria, Va., and the University of Virginia, and was graduated from the Theological Seminary of Virginia in 1889. He was ordered deacon by Bishop Whittle in June 1889 and advanced to the priesthood in August of the same year. He was sent to Brazil as a missionary and worked for nine years, becoming dean of convocation and a member of the standing committee of the mission. The Brazilian Mission was at that time under the episcopal charge of the Bishop of West Virginia. He was consecrated 6 Jan. 1899 by Bishop Dudley, Bishops Doane, Scarborough and Peterkin acting as co-consecrators, and Bishops Potter, Walker, Talbot, G. H. Kinsolving, Wells, Lawrence, and McVicar acting as presenters. The honorary degree of S.T.D. was conferred on him by the University of Pennsylvania in 1899. In 1907 the missionary district of Southern Brazil was established and Bishop Kinsolving became its first missionary bishop.

Klein, Charles, playwright, b. London, Eng. 7 Jan. 1867. His two brothers Herman and Manuel adopted music as a profession. Herman becoming a professor of singing at the Guildhall School of Music, London, and Manuel, a composer of comic operas. Charles attended the North London College, and engaged in dramatic and operatic writing. Combining with his brother Manuel in several of the latter. He is the author of 'By Proxy'; 'The District Attorney'; 'A Paltry Million'; 'The Charlatan'; 'Heartsease'; 'El Capitan'; 'The Hon. John Grigsby'; 'Doctor Bilgraff'; 'The Cipher Code'; 'A Royal Rogue'; 'The Auctioneer'; 'Red Feather'; 'Mr. Pickwick'; 'The Music Master'; 'The Lion and the Mouse'; 'The Daughters of Men'; 'The Third Degree'; 'The Stepchild'; 'The Next of Kin'; and 'The Gamblers' (1910).

Knapp, Martin Augustus, United States judge of the Court of Commerce organized in Jan. 1911; b. Spofford, N. Y., 6 Nov. 1843. He graduated at Wesleyan University, Conn., A.B. 1868; A.M. 1871, and his further college de-

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grees were: honorary A.M. Syracuse University 1892; LL.D. Wesleyan 1892. He was admitted to the bar at Syracuse, N. Y., 1869, and practiced his profession in that city, 1869-91, was corporation counsel, Syracuse, 1877-83; United States Interstate Commerce Commissioner under appointments by President Harrison, President Cleveland, President Roosevelt, serving three terms of six years each from Feb. 1891 to Feb. 1909, acting as chairman of the commission from Jan. 1898, and in Dec. 1910 President Taft named him as one of the judges of the new Court of Commerce for a term of five years and appointed B. H. Meyer, of Wisconsin, his successor as a member of the board of the United States Interstate Commerce Commissioners.

Knight, Albion Williamson, first P. E. missionary bishop of Cuba and 224th in succession in the American episcopate. b. White Springs, Fla., 24 Aug. 1859. Educated at the University of the South, Sewanee, Tenn., where he was graduated B.D. in 1881. He was ordered to the diaconate in 1881 and advanced to the priesthood in 1883, and his first clerical work was done at Palatka and Jacksonville, Fla., where he served 1881-92. In 1893 he was made dean of St. Philips Cathedral, Atlanta, Ga., and in Oct. 1904 he was elected by the General Convention bishop of the newly created Missionary district of Cuba, comprising the Island of Cuba and the Isle of Pines with an area of 47,000 square miles and a population of 1,200,000, and he began work in the district with nine clergy who ministered to 17 parishes and missions, the first annual convention being held at Havana in Jan. 1906. He was consecrated in St. Philips Cathedral, Atlanta, 21 Dec. 1904, and took up his residence at Havana, Cuba, in Jan. 1905. He served as a delegate to the General Convention from the Diocese of Florida twice and from the Diocese of Georgia four times. He was made an alumni trustee of the University of the South and received from this University his degree of D.D.

Koch, Robert, German bacteriologist. b. Klansthal, Hanover, Germany, 11 Dec. 1843; d. Baden-Baden, 27 May 1910. He studied medicine at Göttingen, and practiced in Langenhagen, Rackwitz and Wollstein. He made extensive researches in bacteriology 1872-80, and in the latter year was appointed a member of the imperial board of health in Berlin. Continuing the study of the communicable causes of anthrax, cholera and tuberculosis, and succeeding in isolating the tubercle bacillus in 1882. He was privy counsellor in 1883; director of the German Cholera Commission which went to Egypt and India in 1883 to investigate cholera, and he discovered the cholera bacillus, and on his return to Germany in 1884 he was given 100,000 marks by the government for his services. In 1885 he was made director of the new Institute of Hygiene and professor in the University of Berlin, and an honorary professor and director of the new Institute for Infectious Diseases in 1891. In Nov. 1890 it became generally known that he had discovered and tested a compound substance which when hypodermically injected was destructive to the tubercle bacilli. This announcement caused great excitement throughout the world. Phy-

sicians and consumptive patients travelled to Berlin from all parts of the world in the hopes of a certain cure. Doctor Koch, in Jan. 1891, described the nature of the paratubercle, which proved to be itself prepared from the bacilli, and the reaction attending its use was so marked as to lead many physicians to doubt its ultimate advantages. The German Government, however, began the erection of the Koch Institute for Consumptives fitted with an immense laboratory and 150 beds. Doctor Koch was the author of many works on bacteriological and other medical subjects many of which are translated into English. He was awarded the *Ordre pour La Merite* by the French Government.

Korea. A peninsula in eastern Asia, separating the Sea of Japan from the Yellow Sea. By virtue of the treaty signed 23 Aug. 1910. Korea is under Japanese dominion.

Area and Population.—The country is about 86,000 miles in extent, and the population is estimated at 10,000,000. There were among the Koreans about 123,700 Japanese in 1908. There are, altogether, about 110,000 foreigners at present in the country, 7,000 of whom are Chinese, 300 Americans, 150 British, 90 French, and 50 Germans. About 1,500 Koreans emigrated to Hawaii and Mexico in 1905. The Chinese language is used officially in Korea, but the majority of the people speak a corrupted Japanese. The principal towns are: Seoul, the capital, with 250,000 inhabitants; Ping-Yang, 40,000, Fusan, and Chemulpo.

Constitution, Government, and History.—A Japanese Resident General has superior charge of the administration of Korean affairs. All measures passed and all officials appointed must have the endorsement of the Resident. Head Japanese officials fill many of the important Government positions being eligible for all offices. Since 1909 Japan holds the right to administer justice and regulate prisons in Korea. The country is divided into 339 districts composing 13 provinces. The nominal ruler of the peninsular State is Yi Chok, the Emperor of Korea; born 1874; assumed office 1907. Until the Russo-Japanese treaty of 1905, and the subsequent recognitions of Russia and Great Britain, established Japanese influence in Korea, the office of Emperor was lofty and independent, there was a Cabinet in the Government, but it was impotent apart from its Sovereign. There were six departments of State; viz: the Home Office; the Treasury; Education; Justice, Agriculture, Trade and Industry; and Household. And there was also a Privy Council. But as a result of the war between Russia and Japan, Korea has given itself into the hands of the Government of Japan, and the country is virtually a province of the Island Empire; the Emperor a figure-head. The peninsula in all its government, is wholly subservient to the "advice" of Japan.

Finance.—The total government receipts for the year 1909 amounted to about \$10,449,400, and accrued principally from taxes on land, and from customs duties. The 1909 expenditure was about \$10,880,900. The public debt toward the beginning of 1909 aggregated \$19,435,500. There were three ordinary banks of the Koreans and four Japanese banks in 1908. Besides these there were nine agricultural and

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industrial banks, government-supported The Bank of Korea will soon be established to supplant the First Bank of Japan, and to enjoy the patronage of the Government. The yen is the money-unit in the country, and is worth nearly 50 cents. There are associations in Korea exercising the privilege of issuing notes; the First Bank of Japan has this prerogative also. Coins are 20-yen, and 10-yen pieces; silver, 10-sen, 20-sen, and 50-sen pieces, and there are nickel and copper coins.

Education and Religion—The Education Department of the Government has supervision over schools, in the country, teaching Japanese, French, Chinese, and German. There is a school for English, with 100 pupils, and there is an American Mission school. The Young Men's Christian Association is effectively working in Korea. Technical and industrial schools have been established. Public instruction is dispensed through daily newspapers, Korean and Japanese, and through an English periodical at the capital. There are two hospitals in Seoul, conducted by American missionaries, and several Japanese institutions for the sick. A hospital also exists at Chemulpo, and is directed by an English doctor, and manned with trained nurses. There are many Christianity-professing people in the country. Protestant missionaries from Great Britain and America number about 200, and Roman Catholic, 60. Confucianism and ancestor-worship are the prevalent religious doctrines, in Korea; although there are considerable numbers of Buddhists.

Products and Industries—Land devoted to agriculture in Korea is 4,500,000 acres in extent, and the tilling of the soil is the greatest industry in the country, but the natives use obsolete methods of farming, and the production is not what it should be. Barley, millet, and oats, in the colder regions; rice, wheat, beans, and other grain in the more temperate parts; and tobacco and cotton in the warmest zones, constitute the chief products of the land. Ginseng is also grown. Whale-fishing is an industry in Korea. Minerals found are copper, iron, and coal. The mining-industry, however, is practically confined to the operations of an American company north of Ping-Yang. The facilities for the transportation of produce are inadequate, and the country is backward as a result.

Commerce—The importation of merchandise in 1909 amounted to the value of \$17,356,260; and the exportation (gold not included) to about \$8,793,750. The imports from and exports to China were \$2,441,100, and \$1,123,700 respectively. The imports from the United States in 1908 were valued at about \$2,097,250. The leading imports and exports for 1908 and their respective values were about as follows: Imports, cotton goods and yarn, \$5,453,300; iron and steel, \$1,170,300; grass cloth, \$799,000; silks, \$736,250; timber, \$835,700; petroleum, \$720,750; coal, \$685,300; tobaccos, \$589,250; paper, \$538,900; and sugar, \$462,000. Exports: rice, \$3,271,750; gold, \$2,385,600; beans, \$1,747,000; cattle and hides, \$618,000; etc. Korea has commercial treaties with United States, Germany, Great Britain, Italy, Russia, France, and other countries.

Shipping, Railways, and Telegraphs—Of the vessels registered at Korean ports in 1908,

4,185 were Japanese; 120 Korean; 44 British; and about 50 United States. Coolies, pack-horses, and oxen constitute the most common means of transportation in the interior. There are, however, 275 miles of railway between the capital and Fusan, a line of more than 300 miles in length from Seoul to Wiju, and other short lines. Japan owns the railways of Korea. Telegraph lines extend a total distance of 2,170 miles throughout the country, and are controlled by the Japanese. The principal towns enjoy the use of the telephone.

History, 1910—The fight which Korea made for independence was finally completely lost in 1910 and it became a part of Japan. The country had greatly deteriorated and for 15 years had been a vassal State of China, unable to maintain its autonomy in the stirring events during and following the Russian-Japanese war. Although containing 80,000 square miles of territory and 10,000,000 inhabitants, the kingdom was lost, after 3,000 years. Until the Russian-Japanese War China had asserted a certain authority over Korea, but was compelled to relinquish this at the time of the conflict. Japan immediately appointed itself Korea's adviser and held Korea in the same state of vassalage as China, although Russia objected.

An agreement was signed at Seoul, 23 Feb. 1904 between Japan and Korea which gave Japan the right to use Korean territory for military purposes in return for a guarantee of independence. The Japanese War eliminated Russia's interest in the matter and after that it remained a point of struggle between China and Japan, with China practically out of it. Korea itself was too weak to make more than sporadic, desperate attempts to free itself in which it received absolutely no assistance from the rest of the world which looked on in apparent sympathy with Japan's actions. In 1905 Japan made its first aggressive step leading to annexation, by taking charge of Korea's foreign affairs. Then in 1907 an agreement was entered into permitting Japan to fill offices in the Korean government and be permitted to pass on all appointments to high positions and all administrative acts. This work was done by the Japanese resident-general. In 1909 the administration of justice fell into the hands of Japan and, a year later nothing but the mere form of power remaining, Korea was formally annexed and the show of independence entirely done away with.

As an economic gain Korea is worth to Japan all that it has cost, including two wars and the saddling of the nation with a large war debt. For Japan has needed room for an overflow of population. Its 50,000,000 people are in an area of 148,000 square miles, much of it mountainous and unproductive, while Korea has been inefficiently farmed by its 10,000,000 inhabitants. It is to be expected that a large migration will take place from Japan. Besides land, however, Korea has brought little to Japan. One railroad and few ordinary roads is the total of development, the products of the country having been transported chiefly on the backs of bullocks and men. The trails are even impassable for months at a time and the country has long been one of the most backward in the world. Opposite conditions are

expected to prevail under Japanese dominion. The first move after annexation was a thorough investigation by specialists sent by the Japanese Government to learn what portions of Korea were best fitted for the raising of different crops. Rice was found to grow on a very profitable scale and silk worms produced plentifully. The most important discovery, however, is the possibility of fruit production. All European fruits, grapes, apples, prunes, and pears grow in the interior.

The name Korea, which has now passed from the list of nations, was a singular corruption of the Chinese designation of the kingdom. The real name Cho-sen is the one always used in communication with the Japanese. It has been the name of the country for 500 years. Translated it means "the land of the morning calm." The Chinese name for the Koreans is kao-li, which was easily transformed into ko-ri, and the country became known vulgarly as Korea. Later it was adopted by English-speaking people.

Krauthoff, Louis Charles, American lawyer. b. St. Louis, Mo., 18 Feb 1858. He attended the schools of Jefferson City, Mo., studied law, and was admitted to the bar in 1876. He was assistant attorney-general of Missouri, 1877-78, a representative in the State assembly, 1883. He removed to Kansas City in 1886. He was president of the State bar association, 1890-91, was a member of the Democratic National Committee on the gold standard ticket in 1896, and in 1899 removed to Chicago, Ill., where he was employed as general counsel for Armour & Co. until 1905, when he settled in New York City. He made an exhaustive discussion of "Malice as an Ingredient of a Civil Action" before the American Bar Association in 1898.

Kwang-Chau-Wan. Territory under French lease since 1898, forming part of French Indo-China. The area is about 190 square miles, and the population 150,000. The country is indirectly under the rule of the Governor-General of Indo-China. Kwang-Chau-Wan is administratively divided into three departments. However, the original Chinese local organizations have been allowed to continue. The leading imports into the colony are opium, oil, and cotton yarns, the exports from the colony, straw sacks, mats, and hogs. The exports from Kwang-Chau-Wan contributed substantially to the colonial output for 1908, valued at \$49,404,800. The vessels of two French shipping companies visit regularly at the port, which is free. The roads of the country are fair, there is postal communication.

Kwantung. A territory in the south of Liaotung Peninsula (China), leased to the Japanese. The area is about 1,250 square miles, and the population 427,100. There are about 30,000 Japanese in the population. A Governor-General, appointed from Japan, is in charge of the administration. He resides at Dairen. Education is available in one elementary school where there are 800 pupils. A hospital and a church are maintained by an American Protestant Mission. The public works of the country are chiefly a railway connecting Dairen with Mukden, and the Eastern Chinese Railway System eventually; and the harbor of the capital, which is fitted with warehouses and has a breakwater extending for more than half a mile. The principal articles of agriculture are maize, millet, beans, buckwheat, rice, tobacco, hemp, and vegetables; some of which are exported in considerable quantities. The manufacturing industries comprise salt-works and less important enterprises. Fishing is successfully carried on.

LABOR. Although a number of important strikes took place and the labor unions won and lost a number of advantages, the year 1910 was one of expectancy in the labor world, the most important question being the attitude of the United States Supreme Court towards officials of the American Federation of Labor on trial for contempt in connection with the boycott exercised against the Buck Stove and Range Company of St. Louis. This famous controversy was concluded as far as the strike was concerned, but, nevertheless, the officers of the American Anti-Boycott Association refused to drop the case against President Gompers and his associates and much hung on the Supreme Court's point of view.

None of the year's strikes were in any way crucial, and there was a general tendency towards careful analysis of the situation on the part of both employers and employees and a subsequent arbitration. On this account, while labor as a whole won consistently in betterment of conditions, shortening hours and higher wages, there was not an unusual amount of labor agitation on the surface. The threatened strikes on the railroads were amicably arranged in this manner with the result that both sides to the controversy made concessions and a material advantage was gained in most cases.

It has come to be generally acknowledged by both employers and employees in this country that strikes are more potent of evil than good, with the result that labor unions are loath to resort to them and employers are inclined to meet any feasible settlement of difficulties without forcing a strike or lockout.

To reduce arbitration to a practical basis, many large employers of labor have now on their payrolls arbitrators whose sole business it is to go among the workmen, learn their grievances and settle trouble before it becomes dangerous. To guard against future strikes, at the close of one which had proved an extreme financial drain, the International Paper Company of Albany, N. Y., created a new industrial department and placed at its head John Lundrigan, for 12 years deputy labor commissioner of New York. His sole duty is to act as mediator, hearing complaints from the men and presenting them in such a manner that they can be acted upon, and carrying word from the company to its men over disputed points. While in the pay of the companies, arbitrators of this type are growing in favor. It is recognized that many strikes could easily be settled without trouble. There are cases, however, particularly where fundamental principles are involved, where a compromise can be

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secured only after both sides have given in. The point in contention usually is that of the open or closed shop, the boycott and the right to picket. On all these points there were important activities during the year 1910.

The court decree having the most far-reaching effect was the decision of Supreme Justice Goff, of the New York Bench, which declared illegal not only the closed shop agreement, but placed without the ban any strike over the existence or non-existence of such an agreement. This would make a closed shop a conspiracy in restraint of trade. He further issued a permanent injunction restraining "peaceful picketing." The cloak-makers of New York had been on strike for some time and there had been some, but not a pronounced amount of, violence when the treasurer of the Cloak, Suit, and Skirt Manufacturers' Protective Association brought suit against the International Ladies' Garment Workers' Union and others.

The basis upon which the unions struck was that the manufacturers should agree, in employing help in their mechanical departments, that as between union men and non-union men, of equal ability to do the work, the manufacturers should employ union men as long as obtainable, the strikers suggesting that the employers reserve the right to discharge for incompetency or misbehavior. The pledge they asked was that their employers do not discharge anyone for his affiliations with the union.

The strike finally involved practically all the unions which were engaged in the manufacture of women's clothes, of which New York is the centre. The shirtwaist makers, mostly young Jewish girls, aroused considerable sympathy and were assisted in their fight by wealthy and public-spirited women. They were also the most belligerent of the strikers and the picketing decree, while not directed toward their union, affected them chiefly. The legal fight, however, was finally over the obtaining of a limited recognition of the unions. On this point Justice Goff centered his attention and delivered his opinion. In part, his opinion read: "What the employer may not do, the workman may not do. If a combination of one to refuse employment, except on condition of joining a union, be against public policy, a combination of the others to cause refusal of employment, except on condition of joining a union, is alike against public safety."

Not to be permitted to picket was regarded as a severe blow, but Justice Goff did not stand alone in this point of view. United States Circuit Judge Houghton, of Indiana, issued an order 29 Aug. 1910, shortly after Justice Goff's decision, that strikers should not be permitted either to hold a picket line or maintain quarters in which to congregate. Labor leaders, however, regarded Justice Goff's decision as the most dangerous of the two, since it was less radical and violated no fundamental right.

The cloakmakers' strike was ended at about this time by an agreement giving union workers preference, but not insisting on the closed shop. It was agreed that union wages and union conditions prevail. The outcome of the strike was in principle largely a victory for the unions. Over 70,000 were involved in the strike. Under the agreement a sanitary board, an arbitration board, and a board to pass upon minor griev-

ances were established. In the agreement it is also provided that thereafter there were to be no strikes or lockouts because of differences between employer and employee until the questions involved have been submitted to an arbitration committee. The strikers also received additional pay and shorter hours.

The strikes of the working girls engaged in making neckties, women's waists, etc., were the most picturesque as well as the most important individual strikes of the year. They made demands which were generally regarded as only fair, and conditions under which they worked were such as to arouse the more militant women's organization to their defense. In Chicago well-known women, dressed as working girls, fought off the police, and in New York many prominent women were arrested for participation in the picketing.

Less conspicuous, but no less important, were the strikes of the building trades in New York and elsewhere during the year. Beginning with a strike of the bricklayers, other strikes occurred, and retaliatory lockouts affected altogether 125,000 men at one time and stopped building of work in which \$100,000,000 was involved. The bricklayers alone numbered 31,000. The Bricklayers', Plasterers' and Masons' International Union is not affiliated with the American Federation of Labor or with the building trades. The question involved in their case was one of regulation and jurisdiction, and was not based on any general labor principle. It spread, however, to Chicago, Denver, Salt Lake City, Seattle and San Francisco.

The loss to both sides before the question was settled was \$1,600,000. It was a bigger labor war than appeared on the surface. Both sides were victors to a certain extent, but within the union it was chiefly significant because the national board secured control of the 13 labor unions which formerly had proved refractory. They had already made agreements, chief of which was to refrain from all strikes, and it has been a long fight to secure their affiliation.

The strike in Nov. 1910, among the express wagon drivers of New York, was fundamental. After negotiations towards a settlement had progressed to a certain point, Mayor Gaynor attempted to settle the trouble by acting as arbitrator. After hearing the two sides to the question, he secured the promise of the strikers not to press the claim that their union be recognized, but be content with demanding that no man be discharged because of his affiliation with the union. The Merchants' Association of New York came out openly in repudiation of the attitude taken by the express companies. This strike was attended with considerable rioting, particularly in Jersey City, where police protection was less vigilant. But the worst difficulties arose over the strike of the taxicab drivers, which began as a sympathetic strike but continued in an endeavor to force upon the taxicab companies a recognition of the unions.

In Ohio, during the summer of 1910, there were a number of street-car strikes which equalled in violence the street-car strikes of Philadelphia of the preceding year. Columbus, Ohio, suffered most severely. Governor Harmon attempted unsuccessfully to intervene.

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The city was for some weeks completely paralyzed and stores were temporarily closed for lack of patrons. Cars were run with strike-breakers, but those riding on them were in danger of being struck by bullets and rocks, in spite of 1,500 troops on duty.

Strikes were brought on in a few of the American unorganized coal fields, the most important of which were still unsettled at the close of 1910. It was in the soft coal district of Western Pennsylvania, in the Westmoreland section, and was the result of long-standing differences between mine operators and their men. The men claimed that while the operators appeared to have been favoring them in the matter of prices, they were unable to make as much money as formerly. Union organizers were also among them, and the operators declared the discontent was due to their interference. The ostensible cause for striking was that the miners were ordered to use a permissible explosive (see EXPLOSIVES) upon which the government had passed. This the miners found difficult to get used to, chiefly because it was new to them, and that fact added to their other grievances caused them to strike.

The action of the mine operators in respect to the permissible explosive was altogether to the advantage of the miners, as it would have made the work safer. It is a higher explosive than usually used, but will not emit a flame, in case the shot is "blown out" long enough to ignite the gases which accumulate in the mines in this region. It also has the effect of breaking away the coal in such a manner as not to affect the surrounding rock, thereby lessening the danger from falls, one of the most serious causes of mine accidents. The strike was marked at various points in its progress by bloodshed and a state bordering on civil war.

On the whole, in America, 1910 was a year of few labor disorders, as was 1909. The situation, however, was reversed abroad, which was repeatedly convulsed by labor disruptions. Great Britain, in 1909, had a year more marked by labor strikes than any since 1894. The Board of Trade issued the statistics for 1909 on 1 Oct. 1910, and showed that 300,819 were on strike during the year, but the amount of working time loss was much less than on the former occasion. The aggregate duration of all the disputes in progress amounted to about 2,750,000 working days, little more than one-fourth the number in 1894, and well below the average for the previous 10 years. This indicated a more ready disposition on both sides to arbitrate. This is less of an advance, however, than that shown in this country, where the arbitration usually precludes the necessity of striking. The trouble in England was chiefly with the coal miners, where 78 per cent of the time was lost.

Questions of wages accounted for only 25 per cent of the English disputes, and questions of hours and labor 51. This large proportion of trouble arising over hours was due to special legislation, the Coal Mine Regulations, which went into effect in July 1909. The outcome of the strikers was chiefly in favor of the employers, who won in 22 per cent of the cases, while the strikers won only 11 per cent. All other cases were compromised without giving a decided victory to either side.

Arbitration in 1909 was more generally used than in any previous year. During 1908 railroad boards of arbitration were formed and the example was followed during 1909 in most of the important industrial trades.

The most serious strike which England faced was that of the cotton spinners of Manchester, which was followed by a general lockout. The English shipyards, which have always been sources of trouble, were bound during the year by arbitration agreements. There was, however, a curious lockout against the boiler makers of the Tyne. It included 40,000 men, who, the masters declared, were constantly causing trouble, and the lockout was deliberately for the purpose of getting rid of them. It was complained of them that they would begin a job which was ordered for a certain date and strike unexpectedly, refusing to obey the instructions of their union to keep the agreements made with the masters. In reply the strikers maintained that they were unable to secure recognition of their grievances and were forced to strike in order to make their demands heard.

The strike of the British boilermakers promised to be one of the most stubborn of the year. The masters agreed to declare the lockout ended as soon as the boilermakers would give a guarantee not to break their agreement, but, under the conditions, the boilermakers at first refused. After three months, however, on 13 Dec. 1910, they signed the agreement and returned to work. Wages aggregating \$5,000,000 were lost by workmen owing to this strike.

An inconsiderable strike in the coal fields of South Wales developed into a very threatening situation. A sympathetic strike affecting 30,000 men followed, whose places were taken by non-union men. These were intimidated and the mine owners were able to secure the assistance of the Eighteenth Hussars, a cavalry regiment, to patrol the district, as the police were unable to cope with the situation. Socialists attempted also to bring about a sympathetic strike affecting 200,000 men, but the leaders were against it.

The lockout was used in Germany during 1910 with telling effect. There was a strike of 40,000 shipbuilders who were receiving financial support from the unions of the Metal Trade Workers, numbering close to 600,000, but, learning of this aid, the Association of Employers in the metal trades threatened to lock out 60 per cent of its men unless they withdrew their support of the strikers. In reply the metal workers threatened to call a strike on the other 40 per cent as soon as the lockout was ordered. A similar situation arose in the textile industries where a strike among the spinners caused the mill owners to threaten a lockout against all their employees unless the spinners returned to work. In Germany labor unions are highly organized, and in these most recent strikes aid has been given by the managing committee of the Socialist party.

Nearly 1,700 agreements between employers and employees affecting directly 2,400,000 persons were in effect in England at the close of 1910. Of these agreements 30 were on sliding scales, 566 piece price lists, and 1,103 working agreements. In many cases the agreements were in connection with permanent con-

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ciliation boards and joint committees in the various trades. Some of the agreements contained details and provisions not only as to wages and hours of labor, but also as to the number employed in specified tasks, distribution of work in slack times, enticing away workmen, conditions under which youthful labor could be employed, conciliation and arbitration.

The National Liberal Immigration League urged upon the Department of Commerce and Labor the issuing of daily bulletins on the condition of the labor market. This was in line with a similar movement urged by the Hon. Martin W. Littleton in New York. He advocated labor exchanges, in which experiments have been made in England, Germany and France. The purpose is to bring into close relation the demand for and supply of labor. Under existing conditions, except for information gathered through labor unions in a slow manner, little is known by workmen of conditions in other parts of the country. To obviate this difficulty it is proposed that an attempt be made accurately to ascertain the demand for labor and publish it sufficiently widely to bring the information before all interested. The adoption of this news system by any one state would be more feasible than as a national undertaking and experiments in this matter are anticipated.

An objection stood in the way of ready adoption of this method by union men. It has been the practice hitherto for the local unions to protect the local field and prevent its becoming over-crowded. When the plan reached good working order, however, a condition would be created which would also give an outlet for an oversupply of any particular kind of labor which had accumulated at one point. See LABOR, AMERICAN FEDERATION OF; LABOR ARBITRATION.

Labor, American Federation of. The thirtieth annual convention of the American Federation of Labor was held in St. Louis, Mo., beginning with 14 Nov. 1910. Owing to the contempt proceedings against the officers of the society, growing out of the fight against the Buck Stove and Range Company, and the injunction laid upon the Federations' boycott, other matters remained in the background. An effort was made to secure control of the convention by the Socialist members, but failed. This wing of the convention was led by Victor L. Berger, the Socialist Congressman-elect from Milwaukee. He introduced a resolution seeking to secure a petition to place before the Interstate Commerce Commission, asking that a heavy tax be placed on the products of child labor (q.v.), and having all such products labelled as being made by child labor. Berger also expressed the conviction that many unions, such as the pressmen, printers, and stereotypers, should be merged, but secured no action from the convention.

Secretary Morrison reported that the Federation had 1,561,151 members at the close of the fiscal year, 30 Sept. 1910, a gain of 80,000 over 1909, but 100,000 smaller than 1904, the largest year. The federation's reserve fund was \$183,000. Unions connected with the Federation were involved in 827 strikes during the year, of which 470 were won, 259 were compromised, and 62 were lost.

Several suits were pending in Federal courts against the federation and its members under the Sherman Anti-Trust law. They were being prosecuted by Loewe & Co against the United Hatters of North America, A. Sitomer against the Shirtwaist Workers and Ladies' Garment Workers unions. Against the Federation itself were suits by C. W. Post and the new management of the Buck Stove and Range Company.

In spite of the injunction secured by the Buck Stove and Range Company against the boycott maintained by the Federation, this company abandoned the "open shop" principle for which it had been fighting for years, and, in July 1910, capitulated to the Federation and agreed to employ only union men. This was a distinct victory for organized labor, as the Buck Company has been its most active enemy. The new management took the attitude that organized labor had come to stay for all time and that there was no profit in carrying on an everlasting war against it. The personal enmity against President Samuel Gompers and the other officers of the Federation was not abated by the settlement, however, and the company purposed prosecuting them, as far as possible, for refusing to obey the injunction of the Federal courts, compelling them to withdraw their boycott. See LABOR; LABOR ARBITRATION.

Labor Arbitration. The general sentiment that many strikes could be averted or promptly settled if there were an authorized tribunal where the cases could be heard has resulted in an attempt to bring about the establishment of arbitration boards in all states where labor troubles are at all common. The Commission on Congested Population, appointed by Mayor Gaynor, of New York, outlined the first plan shortly after the serious strikes affecting the clothing manufacturers had been settled in the fall of 1910. They proposed to pattern the tribunal after the one which had been established for two years in Canada, known as the Industrial Disputes Investigation Commission.

A sub-committee made a thorough investigation of the powers and success of this tribunal and agreed unanimously that the best way to arbitrate labor disputes would be through some such court having State authority, and in which both employer and employee could feel confidence. Their proposal is to secure jurisdiction over a labor trouble before it reached the strike stage and, pending its investigation, to impose heavy fines on either employer or employee who should cause a lock-out or strike.

The Canadian act provides for three commissioners, but one with five is considered more advisable, the appointive power to rest with high officials, in the state with the Governor, and in larger cities with the mayors. The parties to the dispute, in this case, would each have the privilege of recommending one member; the third to be thoroughly disinterested and the other two, either to be selected by the three already chosen, or appointed. Prominent members of labor unions endorsed the plan. The disputes over which tribunal would have jurisdiction are:

Wage allowance or other remuneration of employees, or the price paid or to be paid in respect to employment.

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Hours of employment, sex, age, qualification or status of employees, and the mode, terms, and conditions of employment.

Employment of children or any person or persons, or class of persons, or the dismissal or refusal to employ them. This clause puts into the hands of the tribunal the most fruitful cause of long and continuous strikes, those growing out of the recognition of the union and the refusal of employers to keep men in their employ who are members of unions. The establishment of such a tribunal with these powers would unquestionably have the effect of bringing about high standards of labor such as the unions advocate, but would not be favorable to the closed shop. It would prevent interference with union organizers, but would limit their power. In itself it would bring recognition of the unions and would make it much easier to organize all unorganized fields of labor, but would make it impossible for the unions absolutely to dictate to the employers whom they were to employ. It has received the endorsement of both employers and employees because the employer would feel safer from what he considers interference in his affairs, and the unions would establish themselves on a basis a step beyond anything previously attained and would make it much more possible to bring about a fair adjustment of differences and a better standard of living, which are, after all, the chief points sought by the unions.

Materials employed, alleged to be unfit or unsuitable, or damage alleged to have been done to work, would also be fit subjects for arbitration.

The efficiency of this method of dealing with labor troubles is said to be proved by the fact that in two years 53 threatened strikes were averted in Canada by the decisions of the Industrial Disputes Investigation Commission.

The draft of a bill, which will probably become historical as the first of its kind, includes the following provisions:

"In every case where a dispute is referred to a board it shall be the duty of the board to bring about a settlement of the dispute. In the course of its inquiries the board may make all such suggestions and do all such things as it deems right for inducing the parties to come to a fair and amicable settlement of the dispute, and may adjourn the proceedings for any time the board considers reasonable to allow the parties to the dispute to agree upon terms of settlement.

"The board's recommendation shall deal with each item of the dispute and shall state, in plain terms, what, in the board's opinion, ought to be done by the respective parties concerned. Wherever it appears to the board expedient, its recommendations shall also state the period during which the proposed settlement shall continue in force and the date from which it should commence.

"The board has power to summon witnesses, compel testimony, and produce testimony and compel production of documents, as also to hear evidence, whether strictly legal evidence or not, but documents are not to be made public."

One of the most important provisions is that employers and employees must give at least 30 days' notice of any intended change

affecting conditions of employment with respect to wages or hours, and, in the event of such intended change resulting in a dispute, until the dispute has been finally dealt with by the board, neither of the parties affected are allowed to alter the conditions of employment in any way. The effect of this is obviously to the advantage of the employer, as one of the strongest weapons in the hands of labor is the unexpectedness with which it can bring about a strike. Labor leaders have endorsed it, however, in consideration of other provisions which would make it less necessary to coerce their employers. With the board having power to decide disputes over wages and conditions of employment, they feel that conditions will be bettered in general and they will not be compelled to catch their employers at an inconvenient time in order to compel them to listen.

A fine of from \$100 to \$1,000 a day is provided against employers who should break this agreement and \$50 to \$100 a day against employees who strike, pending settlement.

Neither side to a dispute is to be compelled to submit its differences to a board of arbitration, but upon agreement in writing they can bind themselves to its award. Whether the strike has taken place or is merely imminent, such an agreement may be entered into.

This same idea was discussed later in Dec 1910, by the New York members of the influential Civic Federation, presided over by President Seth Low, chairman of the committee. Prominent labor leaders were also present. Their discussion, however, was largely limited to strikes affecting public service corporations and planned for a 30-day period previous to a strike, during which the arbitration board could have an opportunity to effect a settlement. A bill to be presented to the State Legislature in Jan 1911 was also read, which included a provision making it possible to force arbitration in such cases. If either side refused, a petition by any five citizens could be made to the governor, who would by this means be called into the dispute and be placed in a position of authority in the matter. It was also suggested that before a strike or lockout affecting a public service corporation be declared, a copy of the ultimatum be filed with the State Bureau of Mediation and Arbitration.

Recent decisions of the courts regarded as inimical to some of the union labor demands made it appear advisable to union leaders to have its disputes come before another tribunal than the civil courts. A long fight carried on by union carpenters in the vicinity of New York resulted in an injunction which was very unfavorable to such contentions as this one where the carpenters refused to handle material which had been made in non-union shops.

The injunction, which was of a kind to which labor unions have become used in the last few years, was issued by Supreme Court Justice Crane, of Brooklyn, and was sweeping in its inhibitions. In effect, it refused the carpenters' permission to object or allow their objections to the material to be known in any way. It even forbade them spreading their discontent to unions other than their own. See LABOR; LABOR, AMERICAN FEDERATION OF.

Labor, Child. See CHILD LABOR.

Labor, Contract. See CONTRACT LABOR.

LABOR EVENTS IN 1910—LABRADOR

Labor, Convict. See CONVICIT LABOR.

Labor Events in 1910. Occurrences which transpired during 1910 affecting labor conditions and the growth of unionism were of a varied character, but had the general effect of bringing about a more general understanding between employers and union men. The calendar of the year, scheduling the events which were of especial interest to union men follow: 21 January, Thomas L. Lewis was reelected president of the United Mine Workers of America. 27 January, in Sydney, New South Wales, the president of the Northern Miners' Federation was sentenced to one year in jail for obstructing work in a mine during a strike. 4 February, a verdict of \$4,000 was returned against the union hatters who boycotted the establishment of D. E. Loewe & Co., Danbury, Conn. 19 February was the beginning of the Philadelphia street car strike, one of the severest in the history of the country, and attended by numerous daily casualties. 24 February, order was restored by the Pennsylvania Constabulary. 5 March, about 40,000 other union men went on strike in support of the carmen. This was ordered stopped, however, two weeks later, when the carmen refused concessions. 11 March, a coal strike in New South Wales was ended by State arbitration. 28 March, the New York, New Haven, and Hartford Railroad granted an increase in wages and shorter hours to trainmen, conductors, and yardmen. 29 March, the Pennsylvania Railroad volunteered a 6 per cent increase in wages to all employees earning less than \$300 a month. A similar increase was simultaneously made by the Philadelphia and Reading Railroad. 31 March, 300,000 bituminous coal miners stopped work pending settlement of wage demand. 2 April, in the shipbuilding yards of Sir Christopher Furness, in England, after a year's test, the employees decided to give up the profit-sharing plan. 12 April, the New York Central Railroad submitted demands of trainmen and conductors to an arbitration board. 14 April, the United States Steel Corporation increased the pay of 225,000 men sufficiently to swell the payroll by \$9,000,000. 2 April, a general strike of building trades in Berlin was settled by arbitration. 21 May, the Erie Railroad granted an increase of wages to conductors and trainmen amounting to 9 per cent. 27 June, the wages of clerks in the offices of the New York, New Haven, and Hartford Railroad was increased from 8 to 15 per cent. 2 July, a strike was averted on the Southeastern railroads by the mediation of the Interstate Commerce Commission and the Commission of Labor. 19 July, a protest was made against official methods by 10,000 employees on the Northeastern railways, England. 21 July, the English strike was won by the railroad. 2 August, a strike on the Grand Trunk and Central Vermont railroads was ended by intervention of the Canadian Government. 15 August, Governor Harmon, of Ohio, without consulting Mayor Marshall, ordered out the Ohio National Guard to Columbus, for strike duty. 2 September, the cloakmakers' strike which began in New York in July, ended favorably to the strikers. 4 September, a general strike was declared in Barcelona in sympathy with the coal miners. 17 October, a general strike on the French railroads came to an end

after six days, Premier Briand having ordered the strikers as reservists to run the trains. 8 November, agreement was finally reached in the Philadelphia street car strike. 10 November, express strikes which had tied up business in New York were settled, the companies granting higher wages and shorter hours, but refusing to recognize unions. 27 November, Samuel Gompers was reelected president of the American Federation of Labor. 5 December, the striking taxicab drivers of New York, who had struck in sympathy with the express drivers, accepted the terms offered by the companies.

Labor Legislation. See LABOR; LABOR, AMERICAN FEDERATION OF; LABOR, ARBITRATION; MESSAGE, PRESIDENT'S 1910.

Labor-Saving Devices. See INVENTIONS, OFFICE.

Labor Strikes. See LABOR, LABOR, AMERICAN FEDERATION OF; LABOR ARBITRATION.

Labrador. The eastern extremity of the Continent of North America, and forming a dependency of the island of Newfoundland. Labrador extends northward as far as the Hudson Strait, and as far south as the Straits of Belle Isle. The area is undefined. The capital town is St. Johns, Newfoundland, the territory being under the administration of the island. The resources of the territory of Labrador are similar to those of Newfoundland; viz: varieties of fish, seal skins, oil and several minerals. Figures of the trade, etc., are swallowed up in the statistics of the latter Dominion. Labrador boasts a waterfall rivaling Niagara in splendor. It is called the Great Falls of Labrador, and occurs on the Hamilton River.

The inhabitants of Labrador, numbering approximately 25,000 fishermen, faced a hard winter in 1910-11, due to the small catch of fish. The year brought the worst haul in the history of the country. It did not equal 50,000 quintals for the entire coast, while in the year before, itself a poor one, the catch was 160,000 quintals. Dr. Wilfred T. Grenfell, whose missionary work among the fishermen of Labrador has made him famous through the civilized world, and other missionaries, found it necessary to secure what aid was possible and help the people through the winter.

Doctor Grenfell published a book on Labrador during 1910, which consisted of a narration of the work among the people, traveling conditions, reindeer and dogs, written by Doctor Grenfell; a historical introduction by W. S. Wallace; the ornithology by Dr. C. W. Townsend and G. M. Allen; the flora by Dr. E. B. Delabarre, of Brown University; geology by Dr. Reginald A. Daly of the Massachusetts Institute of Technology; and a monograph on studies extending over many years among the Indians by William B. Cabot. Doctor Grenfell collected material for this book for 17 years. In speaking of the inhabitants, Doctor Grenfell points out that they are illiterate, with small method of communication, and leading a hard life with few luxuries. But, in spite of this, he refers to these fishermen as "grand sturdy characters, lovable for their simple virtues, hospitality, truth, faith and loyalty." On account of the arduous life they live, alcoholic liquor is not used, and there is not a licensed saloon along the whole coast. Most of the fishermen

are abstainers on principle, and there has never been a case of drunkenness along the whole coast.

Much of the interior of Labrador remains practically unexplored. Several expeditions were undertaken during 1910, however. The death of Leonidas Hubbard from starvation in the wilderness called attention to the risks of exploration in this country, and a number of expeditions were made. One of the most important of these was by H. Hesketh Pritchard, an Englishman, with a party of three, who passed into a region 200 miles north of the district which proved fatal to Hubbard. Sailing from England on the 200-ton ship *Harmony*, they arrived at Nain, a Moravian mission, and within 20 miles were in unknown territory. Following the Fraser River they purposed crossing the mainland, reaching George River, which runs northward from Ungava Bay, a body of water south of Hudson Strait and Franklin Island, and southwest of Baffin Bay and Greenland. Taking a pound of food for each man a day, as Hubbard had done, they relied on the game they killed. Crossing the high barren, they found it a desolate country, but full of game.

Prof. Raymond McFarland, of Middlebury College, Vermont, made a canoe trip with Prof. Thomas C. Brown and Phelps N. Swett, entered Labrador through the province of Quebec with four Indian guides, ascended from Lake St. John to the Height-of-Land, and penetrated 100 miles north of Foulke and No Chief rivers, into unexplored regions east and northeast of Grand Lake Mistassini.

Labuan. An island possession of Great Britain, lying about 6 miles northwest of the Borneo coast. The area of the colony is a little more than 30 square miles, and the population was last estimated at about 8,400. Victoria is the capital of the island, and has almost 1,500 inhabitants. Europeans in Labuan number about 30, the majority of the population is Malay, although there are some Chinese. The territory falls under the administration of the Singapore Settlement; it was acquired by Great Britain in Oct. 1906, when the boundary of the Straits Settlements was extended. Christmas Island is included with the island of Labuan in the Singapore district, which supplied about \$3,097,500 of the 1908 revenue.

La Crosse. See SPORTS.

Lactic Acid Therapy. See MILK, SOURED.

Ladrone Islands. Called also the *Marianne Islands*. A German possession in the Pacific, forming a part of the New Guinea Protectorate. Guam, the largest of the Ladrone group, belongs, since 1899, to the United States. The Ladrone colony proper had 2,650 inhabitants when last enumerated. The government seat is Yap, which has a population of about 7,000; Yap is, as well, the capital of other New Guinea islands. Malays, Japanese and Chinese compose the population; there are a few Germans. The Marianne group is under the administration of the "Western Carolines" division. The principal export from the colony is copra. Vessels entered at the port of Saipan in 1906 numbered 34 and registered about 7,875 tons.

Lady Chapel. The Lady Chapel of the new Cathedral, Liverpool, England, to be opened in the summer of 1911, is to be adorned by a scheme of stained glass windows commemorating the noble deeds of good women. Besides the famous women of the Bible, the following of more recent times are commemorated. May Collet and all prayerful women, Louise Stewart and all the noble army of martyrs, Christina Rossetti and all sweet singers, Grace Darling and all courageous maidens, Catherine Gladstone and all loyal-hearted wives, Mother Cecile and all women loving and large-hearted in counsel; Agnes Jones and all devoted nurses; Queen Victoria and all noble queens, Mary Rogers (stewardess of the *Stella*) and all faithful servants; Amy Clough and all true teachers.

La Farge, John, American artist. b. New York City, 31 March 1835; d. Providence, R. I., 14 Nov. 1910. His father was a midshipman in the French Navy who, escaping from Santo Domingo where he was a prisoner of war, settled in New York. John studied art in Paris under Couture and technique under Tom M. Hunt. He produced 'St. Paul,' his first important Scriptural picture, in 1861, partially decorated Trinity Church, Boston, 1876; St. Thomas's Church chancel, N. Y., with Augustus St. Gaudens 1877. His other church decorations are in the Church of the Incarnation; Church of the Ascension, New York City, and Trinity Church, Buffalo. The interior decorations in the Vanderbilt mansions, and the music room in Whitelaw Reid's house in New York City, were the production of his brain and brush. He invented the "American" glass used for decoration purposes in 1874, and for this he was decorated chevalier of the Legion of Honor at Paris Exposition in 1889, and he was made an officer of the order in 1901. His decoration glass work is to be seen in the 'Battle Window,' Harvard Memorial Hall, 1878, in Trinity Church, Boston, in the Ames Memorial at North Easton, Mass.; in the Nevins Memorial at Methuen, Mass.; in the Watson Memorial Trinity Church, Buffalo, and the Peacock Window in the Worcester Museum. He was made an American Academician in 1869, and he also served as president of the Society of American Artists and of the Society of Mural Painters. He is the author of 'An Artist's Letters from Japan' (1887); 'Artist and Writer'; 'Lectures on Art' (1898), and two volumes of papers on the old masters and on the painters of the Barbizon School. His 'Wolf-Charmer' was a drawing made for a wood-cut and 40 years after turned into a painting, is by many considered his masterpiece.

La Follette, Robert Marion, American politician. b. Primrose, Wis., 14 June 1855. He was graduated from the University of Wisconsin in 1879, LL.D. 1901, studied law, was admitted to the bar in 1880, and was district-attorney of Dane county, 1880-84. In 1885 he was elected a Republican representative from the 3d Wisconsin district in the 49th Congress, 1885-87, and was reelected to the 50th and 51st Congresses, 1887-91, but was defeated in 1890. While in Congress he served on the Committee of Ways and Means, and was prominent in framing the McKinley bill. In 1891 he re-

LAGERLOF—LAKE MOHONK CONFERENCE

turned to Madison, Wis., and engaged in the practice of law. He was a candidate for nomination for governor before the Republican State conventions of 1896 and 1898, and was elected governor of Wisconsin in 1900, was reelected in 1902 and 1904, and, on 25 Jan 1905, was elected United States Senator for the term expiring in 1911, resigning his governorship. While governor he was leader of the movement to nominate candidates by direct vote, which was adopted by the State in 1904, and also proposed to levy a tax on railroad property by the same system and rate as other taxable property, which was adopted in 1903, and for State control of railroad rates, which was made a law by the State Legislature in 1905. At the Republican National Convention of 1905, he received 25 votes for the presidential nomination. He was reelected to the United States Senate in 1911 for the term expiring 1917.

Lagerlof, Selma, Swedish author: b Marbackagord, Wermland, in 1858. She engaged in teaching, 1885-95, and in the latter year devoted herself to literary pursuits. Her first work 'Gosta Berlings Saga' (1891), a collection of Swedish folklore, was immediately successful and she followed it with her great romance, 'The Miracles of Anti-Christ' (1897), which won her a place in the foremost rank of Scandinavian writers. Her other works include: 'From a Swedish Homestead' (1901); 'Jerusalem' (1901-02); 'The Christ Legend' (1904). She won the Nobel prize for literature, 9 Dec. 1909.

Lake Mohonk Conference. This conference was held in 1910 on 19-21 October. The Indians, the Philippines, and Porto Rico each occupied one day at the meeting. Dr Elmer Ellsworth Brown, United States Commissioner of Education, presided. The Indian program was largely under the direction of Robert G. Valentine, Commissioner of Indian Affairs. Speakers on the Philippines included Commodore George L. Dyer, U. S. N.; Prof. H. Parker Willis, of Washington, D. C.; Dr. John C. Coulter, of Normal, Ill., formerly editor of the *Manila Times*; Dr. William S. Washburn, U. S. Civil Service Commissioner; Bishop Charles H. Brent of Manila; and Prof. Albert Bushwell Hart, of Harvard.

Others who contributed to the discussion were Dr. G. Stanley Hall, of Clark University, who spoke on "Our Dependent Peoples"; Dr. David P. Barrows, of Berkeley, Cal., Director of Education in the Philippines, and the following who spoke on the present situation in Porto Rico: Judge Luis Munoz Morales, of Guayama, and Jose de Guzman Benitez, formerly of the Porto Rican Executive Council.

The "platform" of the conference, an annual feature of the gathering, was presented as follows:

"As the result of nearly 30 years of public debate, the people of this country have wisely adopted as the policy of the nation the abandonment of the reservation system, the dissolution of the tribal organizations, and the incorporation of the Indians as individual members of the American communities. The Indian problem has now become almost wholly one of administration in carrying this policy into effect. This involves:

"The protection by the Federal Government of the personal and property rights of the Indian.

"The vigorous prosecution and condign punishment of all who by violence, fraud, or corruption violate these rights.

"The protection of the Indians during this transition period from the vices of drinking and gambling.

"The sanitation of their homes and settlements.

"The encouragement of friendly relations between the Indians and the local communities, in or near which they are situated.

"The taxation of the inherited and surplus lands of all Indians according to the precedent set by the action of the last Congress relating to the taxation of the Omaha Indians.

"The extension of Indian education until provision is made for the education of all Indian children of school age.

"Special emphasis upon industrial, moral, and political education, that the Indians may be enabled to become self-supporting and self-governing members of the community."

The business committee reported a resolution requesting the President of the United States to recommend to Congress the abandonment of the reservation system in New York State, with provision for the judicial determination of land company claims; also to request the President to have determined whether the Federal or State Government is properly chargeable with police power in New York State reservations, and take such steps as will lead to better regulation of conduct of residents of these reservations, and to request congress and the State of New York to cooperate in these matters. The State Health and Excise departments were asked to enforce sanitary and liquor laws in the reservations.

The Indians have been the subject of discussion for the last 27 years at the Lake Mohonk Conference, and, since the war with Spain, the Porto Ricans and Filipinos have been included. The first of these meetings was in 1883, when Albert K. Smiley, who was and still is a member of the Board of Indian Commissioners, feeling that the questions connected with the Indian problem could be more easily settled if those interested in the betterment of conditions could meet together in conference, invited a few of those most prominent in Indian affairs to be his guests at Lake Mohonk, N. Y. This conference was attended by Clinton B. Fisk, E. Whittlesey, W. H. Lyon, of the Board of Indian Commissioners, by General Armstrong, who was principal of the Hampton Institute, and by seven others, in addition to Mr. Smiley.

The next year, another meeting, composed of 31 members, was held at Mr. Smiley's invitation. The third year there were 56 present, and so the attendance at the Conferences has increased, until of recent years there have often been more than 200 delegates—commissioners, congressmen, Indian workers, educators, editors, philanthropists—gathered at these meetings.

At the first meeting and in all subsequent ones, there seems to have been one fundamental idea underlying the policy for which this conference has stood: that the Indian should become an American citizen. From

LAMAR—LAND OFFICE

the beginning the conference favored the breaking up of the reservations and the allotting of lands in severalty, even in the face of almost universal opposition, and its efforts were rewarded in 1887, when Senator Dawes, of Massachusetts, who was for years a participant in the Mohonk meetings, secured the passage of his bill providing for such allotment.

Regarding education, the conference took the stand that the Federal Government should provide as efficient schools for its Indian wards as were found for white children in the different States, and every measure aiding to extend the school system among the Indians met with its support. And so successful were the efforts of those working to this end, that, as Vice-President Sherman pointed out in his address at Lake Mohonk in 1909, during the 27 years the conference had met, the appropriations for the education of the Indian had increased from \$135,000 to about \$4,000,000 annually.

In view of the fact that many reforms which had absorbed the attention of the earlier conferences were in a fair way to realization, the conference in 1904, decided to broaden its scope to include discussions of questions affecting the welfare of peoples of the Philippines, Porto Rico, and Hawaii, and to change the name of the body to the more inclusive title of "The Lake Mohonk Conference of Friends of the Indian and other Dependent Peoples."

Lamar, Joseph Rucker, Associate Justice of the United States Supreme Court: b. Ruckersville, Ga., 14 Oct. 1857. He was educated at the University of Georgia, Washington and Lee University, and Bethany College, and was admitted to the bar in 1879, establishing himself in practice in Augusta, Ga. He was a member of the State House of Representatives of Georgia, 1886-89; and in 1895 was appointed a member of the commission to codify the laws of that State. He was appointed an associate justice of the Supreme Court of the State in 1903, and served until 1906, when he resigned after two and one-half years of service. He resumed his practice of law in Augusta. In 1910, a vacancy having occurred in the United States Supreme Court, President Taft appointed him to fill that vacancy, and, his appointment being confirmed by the Senate 15 Dec. 1910 he took the oath of office prescribed by law.

Lambert, Louis Aloisius, R. C. clergyman and editor: b. Charleroi, Pa., 13 April 1835. His father came to America from Ireland and married Lydia Jones, a Quaker, who had been converted to the Roman Catholic faith. Louis A. was graduated from St. Vincent's College in 1854, and from the theological seminary of St. Louis, at Carondelet, Mo.; was ordained priest in 1859, and was assistant pastor at Cairo, Ill., and missionary at Shawneetown, Ill., 1859-61; and at the outbreak of the Civil War he joined the 18th Illinois Volunteer Infantry as chaplain and served, 1862-63. He was again pastor at Cairo, Ill., 1863-68; professor of moral philosophy in the Paulist novitiate, New York City, and pastor at Seneca Falls and Waterloo, N. Y. He founded and was editor of the *Catholic Times*, 1874-80; was editor of the *Philadelphia Catholic Times* for two years, and became editor-in-chief of the

New York *Freeman's Journal*, in 1894. The honorary degree of LL D was conferred on him by Notre Dame University in 1890.

Land Office, United States. A fair test of the amount of work performed in any given year in the General Land Office is found by examining the number of cases approved for patent and the number of patents issued. Applying this, it will be seen that there was a greater amount of work performed during the fiscal year ending 30 June 1910, than was performed during the fiscal year ending 30 June 1909. There were received in the office during the year 420,160 letters of which in round numbers 300,000 required an answer. The total cash receipts from the sales of public lands, including fees and commissions on both original and final entries for the fiscal year 1910, were \$8,371,637.10. Miscellaneous receipts were as follows: From sales of Indian lands, \$2,037,551.68, reclamation water-right charges, \$770,586.35; depredations on public lands, sales of government property, and copies of records and plats, \$284,148.93; making the aggregate total of cash receipts of this bureau during the fiscal year 1910, \$11,463,924.06, a decrease of \$752,491.33 from the fiscal year 1909. The total expenses of district land offices for salaries and commissions of registers and receivers, incidental expenses, and expenses of depositing public money during the fiscal year ended 30 June 1910, were \$873,637.33, an increase of \$29,541.49 over the fiscal year 1909. The aggregate expenditures and estimated liabilities of the public land service, including expenses of district land offices, were \$3,179,363.49, leaving a net surplus of \$8,284,560.57. The total area of public and Indian land originally entered during the fiscal year 1910 is 26,391,269.09, an increase of 6,498,765.33 acres, as compared with the area entered during the year 1909. This large increase is due to the great number of entries made in the Northwest, principally in the State of Montana, where, at one office, Great Falls, there was approximately as much land entered during the fiscal year, namely, 2,064,502.06 acres, as there was in the whole State of Montana during the fiscal year 1909. The area patented during the fiscal year is 10,983,150 acres, a decrease of 1,825,661 acres, as compared with the fiscal year 1909, which was the first year that statistics relating to the area of lands patented were compiled. The number of patents issued during the fiscal year 1910, however, exceeded that of 1909 by 2,163. Of this area 7,404,598 acres were patented under the homestead law.

On 4 March 1909, Congress appropriated the sum of \$1,000,000 for the "protection of public lands, timber, etc." for the fiscal year ended 30 June 1910, which amount was to be immediately available. The average number of special agents employed per month under this appropriation during the fiscal year was 216. The total amount of cash collected and turned into the treasury as a result of the work of the special agents in the field during the fiscal year is \$349,234.01. Since the issuance of the last annual report, six national forests have been enlarged and 26 reduced under the act of 4 June 1897 (30 Stat., 36), and the Las Animas National Forest was consolidated with the San Isabel National Forest, Colorado.

LANDON—LAYMEN'S MISSIONARY MOVEMENT

Landon, Melville Delancy ("Eli Perkins"), humorist: b Eaton, N. Y., 7 Sept. 1839; d Yonkers, N. Y., 16 Dec. 1910. He attended Madison (now Colgate) University, and was graduated from Union College A.B. 1861, A.M. 1864. He was appointed to a position in the U. S. Treasury Department, Washington, D. C., and at the beginning of the Civil War he helped organize and became a member of the Clay Battalion, later serving on the staff of Gen. A. L. Chetlain, at Memphis, Tenn. In 1864 he resigned from the army with the rank of Major and was interested in cotton planting in Louisiana and Arkansas, 1864-67. He traveled abroad, and in 1868 was appointed Secretary to the American Legation at St Petersburg. While at the Russian capital he engaged in writing, and on his return to the United States he published his first book, a humorous prophecy, 'Saratoga in 1901'. This he followed with 'A History of the Franco-Prussian War' (1871). He became president of the New York News Association and contributed humorous articles to various newspapers under the nom-de-plume "Eli Perkins," which had been given him by Artemus Ward. He managed one of the lecture tours of Henry Wheeler Shaw ("Josh Billings"), and although the tour was a financial failure, he published a humorous interview with Josh Billings in one of the New York papers, which gained him great popularity, and was the first step to his subsequent fame. He is the author of 'Wit, Humor, and Pathos' (1875), 'Wit and Humor of the Age' (1880), 'Kings of Platform and Pulpit' (1887), 'Thirty Years of Wit' (1890); and 'Eli Perkins on Money—Gold Silver, and Bimetallism' (1895). He lectured extensively until with advancing age his health forsook him, and he retired from active work. He suffered for six years with locomotor ataxia, which disease was the cause of his death, at the age of 71 years. After listening to one of Mr Landon's quaint stories, Benjamin F Butler is quoted as having remarked, "I know the three greatest hars in the world, Mark Twain is one, and Eli Perkins is the other two."

Land, Public. See LAND OFFICE, UNITED STATES

Lane, Jonathan Homer, American mathematician and physicist. b Genesee, N. Y., 9 Aug. 1819; died at Washington, D. C., 3 May, 1880. Some mathematical methods invented by Lane for treating of the theory of the sun's heat, under the hypothesis of a gaseous constitution, in 1868, have become classic and justly celebrated (cf. *American Journal of Science* for July 1870). They have since formed the basis of important researches on the internal constitution of the sun and stars by Newcomb, Lord Kelvin, Ritter, Perry, See, and others (cf. *Astron. Nachr.*, No. 4053), and may be regarded as a permanent part of one of the most difficult branches of mathematical astronomy. Lane was the son of a poor farmer, early became an inventor of clocks and similar contrivances, thus showing a remarkable mechanical turn of mind. He was educated at Philips Academy, Exeter, New Hampshire, and at Yale College, where he made his way largely by tutoring. He afterwards taught in the Seminary at Castleboro, Vermont, and in 1847 was called to a minor position in the U. S. Coast

Survey. On 1 July 1848, he was appointed Assistant Examiner in the Patent Office, on the recommendation of Professor Joseph Henry, Secretary of the Smithsonian Institution. He was promoted, and rendered distinguished service till 1857, when he was removed on political grounds. Lane then became an expert counselor in patent cases, but kept up his interest in pure science and in electrical inventions, investigating the problems of the Atlantic Cable at the request of Secretary Henry. About 1861 he engaged in the oil business in Pennsylvania, and from 1866 to 1869 was occupied with experiments in the mechanical production of low temperatures. In 1869 he accepted a position in the Coast Survey as verifier of standards, which he held till his death in 1880. Lane published only about 15 papers, but all of them were of high order at the time of their production; and most of them are still valuable. His biography has been written by Professor Cleveland Abbe, in Vol. III. of the 'Biographical Memoirs of the National Academy of Sciences,' and by Professor T. J. J. See, in *Popular Astronomy*, No. 134, April, 1906

Laos. See SIAM.

Laryngological, Rhinological and Otolological Society of America. A scientific medical organization. The society held its annual meetings on 28-30 April 1910, in the city of Washington. The society is divided into four sections, each of which holds an annual meeting of its own members in addition to the annual meetings of the whole society.

Latin American Independence and Politics. See MESSAGE, PRESIDENT'S.

Law Enforcements and Civil Service Law. See MESSAGE, PRESIDENT'S.

Lawn Tennis. See SPORTS

Laws and Legal Practice. See LEGAL DECISIONS AND OPINIONS.

Laymen's Missionary Movement. The Laymen's Missionary Movement is without question one of the most spectacular enterprises which Church history records. It calls to mind, in the number of persons enthusiastically interested, in the wide territory marking the field of action, in the martial aspect of deeds and methods, and in the announcement that the whole of the vast undertaking is in the name of the Founder of the Christian religion, the great Crusades of the eleventh, twelfth and thirteenth centuries.

The genesis of this new crusade was at a meeting held in the Fifth Avenue Presbyterian Church in New York City, 13-14 Nov. 1906. The occasion was an interdenominational gathering to commemorate the centennial of the famous "Haystack Prayer Meeting," which is recognized as marking the beginning of the American foreign missionary movement. During the progress of this meeting a "call to prayer" was sent to a number of laymen asking them to gather on the afternoon and evening of the day following, 15 November. At this meeting the Laymen's Missionary Movement was organized.

In the preamble to the resolutions then adopted, recognition was made of the fact that the doors of every nation were at length open

LAYMEN'S MISSIONARY MOVEMENT

to the gospel, that the missionary work of women, young people and of students was highly and efficiently organized, and that the participation of the present generation of responsible Christian and professional men was "essential to the wisest and most productive use of the existing missionary agencies."

It was resolved to appoint a committee of twenty-five or more representative laymen to consult with the Missionary boards of all the denominations of the United States and Canada with reference to the following propositions: (1) "To project a campaign of education among laymen to be conducted under the direction of the various boards; (2) to devise a comprehensive plan (in conjunction with said board secretaries) looking to the evangelization of the world in this generation; (3) to endeavor to form, through the various boards, a Centennial Commission of Laymen, 50 or more in number, to visit as early as possible the mission fields and report their findings to the church at home."

Mr Samuel B. Capen was made chairman of the executive committee and Mr J Campbell White the general secretary. The committee included such well-known names as Joshua Levering, Silas McBee, John R. Mott, Robert E. Speer, Mornay Williams, Wm Jay Schieffelin, J. Edgar Leaycraft, etc. In the list of the general committee are to be found the names of John Willis Baer, Samuel W. Bowne, J. Cleveland Cady, John H. Converse (deceased), Cleveland H. Dodge, John S. Huyler, Dr Howard A. Kelly, Captain Alfred T. Mahan, Robert C. Ogden, and John Wanamaker.

The work of the Laymen's Missionary Movement has been almost entirely educational and inspirational. Its officers insist that it is not a new missionary board to collect funds or administer them, that its work is not to raise up or to send out missionaries; that it does not work outside of regular denominational lines.

The General Committee as now organized consists of more than one hundred men who meet semi-annually. The executive committee has 21 members, fifteen from New York and vicinity, 2 from Washington, 1 from Boston, and 1 from Canada. The latter committee meets monthly in New York. The movement publishes a monthly magazine, *Men and Missions*.

A Canadian National Congress of the movement was held at Toronto from 31 March to 4 April 1909. More than 2,500 laymen and 1,500 ministers were registered as commissioners to this Congress. It has been stated that this was the first time in modern history that representative men of all churches of a nation have come together to plan for a world-wide extension of the Christian religion. The "National Missionary Policy" adopted by this Congress received the formal endorsement of practically all the official church conferences, synods and assemblies throughout the Dominion.

The Congress voted unanimously that the reasonable offering of the 900,000 communicants in Canada whom they represented should be \$1,300,000 annually for home missions and \$3,200,000 for foreign missions. The delegates to this great Congress paid not only their own traveling expenses but also registration fees, which aggregated a sufficient amount to defray all the expenses of the Congress. Later, sepa-

rate movements were organized by the Anglican, Baptist, Congregational, Methodist, and Presbyterian Churches of Canada, each employing a secretary. In addition to this denominational work, an interdenominational movement has been organized with a General Secretary.

The movement had previously taken root in Great Britain and Australia. The British Missionaries invited a deputation to visit them, and as a result 6 laymen were sent to London in May 1907, who were received officially at the Bible House by about 75 representatives of the Boards. Mass meetings were held in London, Liverpool, Bristol, Sheffield, and Edinburgh. At Liverpool the gathering, numbering 1,800, was said to be the largest men's missionary meeting ever held in that city. Lord Guthrie, Lord Kinnaird, Lord Overtoun, and many other notable men of the United Kingdom, identified themselves with the movement. Mr. Kenneth MacLennan was made general secretary for Scotland.

But the most striking results of the movement have been achieved in the United States. Two great state conventions were held in the Spring of 1909, one at Minneapolis, the other at Des Moines. Denominational gatherings were called. The Presbyterian Church South held a three-day convention at Birmingham, Ala., at which over a thousand delegates were present. The conference accepted and endorsed a standard of \$4 per member to Foreign Missions. Two secretaries give their whole time to the work in this denomination. A convention of 1,000 men was held by the Southern Methodist at Chattanooga, Tenn. The General Conference of the Methodist Episcopal Church, meeting at Baltimore in May, 1908, endorsed the movement and voted to increase their scale of giving from \$2,000,000 in 1908 to \$6,000,000 annually by 1912. This church employs two secretaries. The Northern Presbyterians held conventions at Omaha and at Philadelphia. These conventions recommended an increase of the missionary offerings of their denominations to the standard of \$5 per member. The Southern Baptist Church and the Reformed Church of the United States have each organized a Laymen's Missionary Movement, each employing a secretary. The American Board (Congregational), the Board of Missions of the Episcopal Church and the Dutch Reformed Board have appointed committees to coöperate with the movement. In the Northern Baptist Church the Baptist Brotherhood has been charged with the responsibility of enlisting the laymen in missionary endeavor. The Annual Conference of the Foreign Boards of the United States and Canada, including 49 societies, has appointed a committee to cooperate with the movement.

The most thrilling single campaign was that conducted throughout 75 cities of the United States from Oct. 1909 to May 1910, culminating in a delegated Congress at Chicago, 3-6 May. At some of the more important centres the numbers of men attending were as follows: Buffalo, 1,240; Cleveland, 1,450; Washington, 1,714; New York, 3,350; St. Louis, 1,633; Memphis, 1,355; Topeka, 1,487; Kansas City, 1,647; San Antonio, 1,525; Boise, 1,500; Spokane, 1,552; Indianapolis, 2,875; Lincoln, 1,600; St. Paul, 1,566. At the concluding Congress in Chicago 5,000 delegates were present.

LEAGUE OF MEDICAL FREEDOM—LEFT-HANDEDNESS

The resolutions adopted by this first "National Missionary Congress" declared that "the Church of our generation can and should obey literally the great commission of our Lord, to preach the Gospel to every creature." It is estimated that one missionary should be provided by the Church in Christian lands for every 25,000 people to be evangelized. This would involve a quadrupling of the present force of missionaries and an increase in missionary offerings from \$11,000,000, the amount contributed in 1909, to \$45,000,000 annually. It urged the adoption by every church of regular and thorough methods of missionary education and finance, recommending that once every year each congregation be canvassed "with the earnest purpose of securing the systematic and proportionate contributions of every member toward the world-wide propagation of the Christian evangel." It recommended the formation in each individual church of a strong missionary committee and the appointment in each city or county where work is undertaken of a Cooperative Committee of the Laymen's Missionary Movement.

Two or three illustrations may suggest that the challenges made by the men gathered at these enthusiastic conventions have met with definite response. In Houston, Tex., the convention voted to increase the missionary offerings, from less than \$7,800 to \$25,000. In less than three weeks from the adjournment of the convention the sum of \$28,108 had been subscribed. The offerings of the Southern Presbyterian Church were increased from \$275,000 in 1906 to \$412,000 in 1908. Mr. N. W. Rowell, K. C., of Toronto, chairman of the Canadian Council of the movement, reported that 4 Anglican churches in the city of Toronto increased their missionary offerings from \$14,300 for 1908 to \$35,250 for 1909, that the Baptist churches advanced from \$23,225 in 1907 to \$55,005 in 1908, the Presbyterian from \$46,332 to \$98,553; the Methodist, from \$53,397 in 1907 to \$93,125, in 1909. Many reports have been received indicating that the general religious activities of the churches and the offerings for the work of home missions have been augmented rather than weakened by this increased interest in the foreign work.

League of Medical Freedom. See MEDICAL FREEDOM, LEAGUE OF.

League of the Home and School. See HOME AND SCHOOL, LEAGUE OF.

Lea, Luke, American lawyer and politician: b. Nashville, Tenn., 6 Feb. 1879. Received his education in the Nashville public schools, Sewanee University, and, in law, at Columbia. His career as a lawyer has been marked by much public spirit, both in local and State affairs, in pursuance of which he started the *Nashville Tennessean*, and afterward absorbed the *Nashville American*, the oldest newspaper in the State. It was while he was coeditor with Senator Carmack, of the *Tennessean*, that the latter was assassinated. It was due to Lea's ability and leadership that the political career of Governor Patterson, who pardoned the slayers of Carmack, was brought to an end. In Jan. 1911, Lea was elected United States senator, the youngest senator in the 63d Congress.

Lee Statue. See GRAND ARMY OF THE REPUBLIC.

Leeward Islands. British possessions in the West Indies. They are made up of Antigua, St. Kitts-Nevis, Dominica, Montserrat, and the Virgin Islands. The total area is about 700 square miles, and the population, as estimated in 1901, 127,500. There were about 5,000 whites in the 1901 population. The Governor and Commander-in-Chief of the colony is assisted in the administration by a Legislative Council of 16 members, half nominated, half elected, and by an Executive Council, whose members are nominated. The Government receipts in 1909 amounted to \$757,560, and the expenditures to \$731,080. The public debt in 1909 was about \$1,359,800. The Government supports education, which is chiefly promulgated by religious organizations; the grant amounted in 1908 to about \$43,800, and was distributed among 144 elementary schools with 12,200 pupils, and 7 secondary schools with 260 pupils. Justice is administered in a Circuit Court, in which there were about 75 convictions in 1908, and in lesser courts. The chief products of the Leeward Islands are molasses and sugar. Cocoa is produced in valuable quantities, and the raising of onions has become a profitable industry. The imports into the colony in 1909 were valued at \$2,837,400 (including intercolonial commerce), and the exports amounted to the value of about \$2,681,500. Tonnage entered and cleared at the ports for 1908 was about 2,507,350 tons.

Left-Handedness. Theories as to the causes of the universal right-handedness we see have been numerous; but, though speculations have been advanced for many years, no acceptable theory has as yet been forthcoming. It is true that about 95½ per cent of all people are right-handed. As the right side of the body is supplied by the left side of the brain (hemisphere) practically all our memories are stored on that side, and the left-hemisphere is virtually useless for all such mental operations. If a right-handed person suffers a stroke of paralysis, the left hemisphere is involved. The result is that the power of speech is lost, as only the speech centre on that side is developed through practice; but on the right side it is useless, though present and unimpaired.

Professor Lipman has recently made some interesting practical additions to medical knowledge in his study of such cases, and in his practical application of a remedial measure. He found that, by developing the left hand equally with the right, by exercise (and hence, by making the unused right hemisphere of the brain the full equal of the left side in power) the activity of that side of the brain is thereby aroused; and not only is power restored to that side, and writing and complicated movements rendered possible, but speech is again restored if the centre is in no way involved.

For example: By systematic writing-exercises with the left hand, a patient whose right hand was paralyzed regained the power of speech which he had lost. The centre of speech on the right side, which had formerly lain dormant, had been awakened to complete activity. That this possession was permanent was proved when the patient suffered a second stroke. This robbed him again of the use of his right hand, which was beginning to return,

but left his speech unimpaired! The centre of speech had passed—by means of the writing exercises with the left hand—into the possession of the right side of the brain.

Still more striking is the success achieved in a case treated by Gutzmann. As a boy of thirteen, the patient had lost his left hand, owing to a shot wound, but had learned to use an artificial hand quite well. At the age of thirty, he suffered a stroke which completely paralyzed his right side and robbed him of the power of speech. The poor fellow could not move his arms, had to be fed, and, with his wooden left hand and his paralyzed right arm, presented a pitiable picture.

By means of a little instrument—a wooden ring with a pen attached—which fitted on the index finger of his wooden hand, he gradually learned to write and to make himself understood by those about him. But he retained also his power of speech and, not only that, but his command of Russian and French as well.

In this case, it will be seen, systematic development of the right hemisphere of the brain restored the lost speech and again rendered the patient a fit member of society. These experiments have created a profound impression; and there is every reason to hope that, in the near future, systematic and successful treatment in cases of this character will be undertaken. There are, further, the practical benefits to be derived from the cultivation of ambidexterity.

Legal Decisions and Opinions, 1910.

Code of Legal Ethics—A committee of the New York County Lawyers Association, of which Alton B. Parker is president, presented a report on 6 Oct. 1910 on the proposed code of legal ethics. The chairman of the committee, Charles A. Boston, stated that in the preceding year complaints had been made regarding the practice of 1,200 lawyers in New York county. The code, which was to be printed and sent to the members for their consideration, did not permit a lawyer to accept as a client a man whom he knew to be guilty. A lawyer could not solicit business nor advertise if this code went into effect, and furthermore it would prohibit the willful misleading of judge or jury.

Guilt in the Legal Code—The fifth ethical declaration in the code as framed by a committee of eminence, submitted to the deliberation of the bar throughout the country and adopted by the American Bar Association three years ago, relates to the question of the propriety of defending a client known by his lawyer to be guilty. Between the lawyer's duty to secure the guilty client in all his legal rights and the propriety on his part as an officer of justice of attempting to secure the client's freedom, though the ends of justice are palpably defeated, lies the controversial gulf. The fifth clause of the ethical code bridges it in this wise: "It is the right of the lawyer to undertake the defence of a person accused of crime regardless of his personal opinion as to the guilt of the accused; otherwise innocent persons, victims only of suspicious circumstances, might be denied proper defence." Herein the personal equation is magnified. The lawyer cannot know it if his client be guilty. His "opinion" does not establish guilt. Only trial by jury can estab-

lish guilt. That the clause represents the deliberate judgment of the great majority of the profession is shown by its adoption. The code in terms puts a burden upon the prosecuting attorney to make a clear case, regardless of whether his information favors the defendant or the people, on the ground that "the primary duty," so far as the prosecution is concerned, "is not to convict, but to see that justice is done." On both sides the main concern is supposed to be for a fair trial, rather than for either conviction or acquittal.

Is Evidence Trustworthy?—Professor Marquis, of Lausanne University, Switzerland, has made tests of the power of observation of students, which seem to prove that evidence given in law courts is seldom trustworthy. He questioned a number of his students concerning various parts of the university buildings and other objects which are before their eyes every day. Out of 54 students, not one was able to answer the given eight questions correctly, and when asked about a certain window, 45 denied its existence, eight affirmed it, and one remained undecided.

Another test was to ask them to describe the dress and appearance of a man wearing a mask who had been introduced into the lecture-room two days before. Their answers varied considerably. They were also shown 10 masks, out of which they were to select that worn by the man. Out of 24 students only four recognized the correct mask, 11 made mistakes and nine could not make up their minds about it.

"All these persons," says Professor Marquis, "are men of education and culture. What, then, are we to think of the statements made in criminal law courts by persons who belong to less educated classes?"

New Edition of Criminal Code—The Government issued early in November a new edition of the Criminal Code of the United States. It is the first and only chapter yet enacted into law of the revision of the laws of the United States. This revision has been in progress for more than 10 years, and other sections of it will be presented to Congress as rapidly as they can be finished. The present criminal code prescribes penalties for all infractions of the Federal laws. It is not, however, as extensive a volume as might be supposed, for the reason that a great majority of criminal offenses are dealt with by the laws of various States. The new edition of the criminal code is complete. It includes not only the full text but also certain amendments made at the last session of Congress.

Reform in Jury System—Henry M. Earle, a contributor to *Bench and Bar*, addressed inquiries to jurors after they had decided cases in which he was interested and learned that comparatively few of them realize that their only concern is with the facts in the case revealed by the testimony. They render decisions based on supposed principles of equity, or of charity; occasionally the court's charge as to the law was admittedly ignored, on the theory that it merely followed a meaningless formality; and comparatively few jurors are able to forget testimony given and stricken from the record as inadmissible.

Mr. Earle suggests a more careful instruction of every jury as to the limitation of its

powers and the exact nature of its duties. He would have the men drawn for this service supplied by the commissioner of jurors or county clerk, with printed instructions carefully pointing out to them the difference between their task and that of jurors, and explaining the fundamental rules of evidence that bear upon their utilization of it. *Bench and Bar* suggests that real reform lies in presenting to the jurors only definitely formulated questions of fact, to be as definitely answered, and in making the foreman a chairman, with power to direct and control the discussion of the evidence.

Justice Hughes' First Opinion—The first published opinion of Justice Charles E. Hughes, who took his seat on the United States Supreme Court bench in November, was published early in December. The United States Circuit court for the District of Massachusetts had held insufficient three counts in an indictment against Frank H. Mason, former clerk of the Federal Court for the District of Massachusetts, on the charge of alleged embezzlement. Justice Hughes decided, on appeal, and was unanimously upheld by the Court, that not until after a statement of account had been formally made by the court clerk was there any obligation to pay over money to the Government, and even then if the clerk were found to be indebted his relation was that of debtor and not of trustee.

Liability of Express Company—The Appellate Division of the Supreme Court of New York, First Department, has decided, in the case of *Meister vs. The New York Transfer Company*, that if the representative of an express company takes an article of baggage for transportation and the baggage is lost, the carrier must pay the full value of the article unless the carrier inquires as to its value when it was accepted for transportation. In the case at bar the carrier contended that its liability should be limited to only \$150, although there was no inquiry as to the value. Presiding Justice Ingraham, writing the opinion, said that the question presented arises under the public service law, which provides that every common carrier, including an express company, shall be liable for "all loss, damage, or injury to the property carried as baggage up to the full value and regardless of the character thereof, but the value in excess of \$150 shall be stated upon delivery to the carrier, and a written receipt stating the value shall be issued by the carrier, who may make a reasonable charge for the assumption of liability in excess of \$150 and for the carriage exceeding 150 pounds in weight upon a single ticket."

Duty of a Carrier—The "defendant-in-error" in the case of the Texas Midland Railroad *vs. Gerald* (128 S. W., 611) brought the action against the road for personal injuries inflicted by the agent in putting him and his family out of the railroad station while acting under orders to close the station for the night; although it was several hours before train time. His wife was wet through by the storm that was raging, and having no change of clothing, it was alleged that she suffered a permanent impairment of health. In affirming a judgment in the complainant's favor the court decided that he and the members of his party were not trespassers, but became passengers as soon as they entered the station. The court conceded that the railroad company has a right to make

reasonable rules, and that it is the agent's duty to enforce them, but declares that the case is similar to that of a conductor who if he finds it necessary to expel a passenger must see to it that the passenger is not exposed to danger of health or life, either on account of the place where the expulsion occurs or the conditions as to weather. Commenting on the decision the *New York Law Journal* says: "Circumstances are easily imaginable that would clearly render the so-called 'doctrine of necessity' cases applicable to refugees in a railroad depot. If a violent blizzard were raging and no other shelter were near, or if a person were very seriously ill, it might well be held that expulsion was actionable. The 'doctrine of necessity,' however, should be applied with circumspection, and should be practically recognized only in exceptional cases. Certainly the Texas court went to great lengths in administering it under the actual circumstances disclosed."

A good cause of action for damage was recognized also in the case of *Metcalf vs. the Yazoo and Mississippi Railroad* (52 So. 355). The Mississippi statutes require railroads to maintain reasonably necessary stations and to keep them open at least an hour before the arrival of trains for the reception of passengers. The plaintiff's decedent went to the station of the defendant, 15 minutes before the arrival of the train, with the intention of leaving his satchel in the waiting room and then stepping out to make a business call in the neighborhood before train time. As he stepped out of the door of the station he fell into an excavation and received injuries resulting in his death, for which suit was brought. In its decision the court said: "He was making the very use of the waiting room that the railroad and the law designed should be made of it. Conly was no loiterer on the depot grounds. He was no idler or trespasser; but he was there on the lawful business of an intending passenger."

The court found no case precisely like the one on trial, but said that the case of *Andrews* against the same railroad (86 Miss., 129) was no authority for the question involved. In the *Andrews* case the plaintiff went to the station two hours before a train was due and went into the private office of the station agent to do some writing on account of his own affairs, thus making use of the company's office for the transaction of his own business. While so engaged he and the agent became involved in a personal difficulty over a private matter, and the court held that *Andrews* was not a passenger, but was violating the rules of the company and could not claim its protection.

Riparian Rights.—A private water company, acting under a legislative charter of long standing, has been taking a large part of the water of the Passaic River above the City of Paterson for diversion and sale to various municipalities. The City of Paterson brought suit against the company to enjoin it from taking the water, on the ground that thus Paterson, a riparian owner, was deprived of the use of the full flow of the river for the dilution of its sewage and for other purposes. The Court of Chancery of New Jersey, sustained by the Court of Errors and Appeals, held that Paterson had no right to relief on the ground that the water was needed for dilution of sewerage, as that was not a legitimate use of the river, but that it had such

right on the general ground that it was entitled to the full flow of the river for other legitimate purposes.

The principle was enunciated that while a riparian owner may use the flow of a stream on the spot for legitimate purposes, it may not divert that flow for its own profit for sale and use elsewhere, to the detriment of other riparian owners further down the stream. Diversion of the water of a stream for purposes of sale "is of itself a violation of the right of the riparian owner, without proof of any actual perceptible damage," but the right of the complaining municipality to relief "rests only upon its standing as a riparian owner, and it has no standing in the claim of a right to construct a sewer system discharging undiluted sewerage into the river and to the undiminished flow of the river for the purpose of diluting the sewage."

Rights of a Mortgagee.—A question never before passed upon directly in New York State has been decided by the Appellate Division of the Supreme Court, First Department, in *Heilbrun vs. the German Alliance Insurance Company of New York*, in which the court by a divided bench rules that the mortgagee of premises in which there has been a fire loss may sue to recover on a policy without first giving the insurance company proof of loss and an opportunity to arbitrate the claim. The plaintiff's assignor held a mortgage on the insured building and there was attached to the policy a mortgage clause, which, as the insurance company admitted, provided that the loss or damage should be paid to the mortgagee as his interest might appear, and provided that the interest of the mortgagee should not be invalidated by any act or neglect of the mortgagor or owner of the property described. The complaint in the case merely alleged the fire and the amount of loss and the proportion due from the defendant. The complaint was silent as to whether the insured, the mortgagee or his assignee had served notice and proofs of loss, and the defendant demurred on that ground. The lower court sustained the demurrer, and the Appellate Division reversed the order.

Justice Scott, who wrote the majority opinion, said: "The interest of the owner and the mortgagee are regarded as distinct subjects of insurance. As was said by Rapallo, J. I think that the intent of the clause was to make the policy operate as in insurance of the mortgagors and the mortgagees separately, and to give the mortgagees the same benefit as if they had taken out a separate policy, free from the conditions imposed upon the owners, making the mortgagees responsible only for their own acts (*Hastings vs. Westchester Fire Ins. Co.*, 73 N. Y., 141). . . . Many of these obligations thus imposed upon the owners relate to matters concerning which the mortgagee is not presumed to have knowledge or with which, in the nature of the case, he could not comply. This includes the giving of immediate notice of the loss, of which the mortgagee may be ignorant for a long time, and the furnishing of proofs of loss, which the mortgagee may be quite unable to do. We are, therefore, of the opinion that the mortgagee was under no obligation to furnish proof of loss or to give any earlier or other notice of loss than that involved in the commencement of this action."

Justice Laughlin, in his dissenting opinion, said "It scarcely needs reflection to realize that if a mortgagee may recover six years or more after the loss, without notice of the fire, proof of the loss or opportunity for arbitration, the door will be opened wide not only to fraudulent claims upon which the companies will be victimized, for they will be helpless in many instances to defend themselves against dishonest claims, but also to collusion between owners and mortgagees." Justice Laughlin cited the decision of the Court of Appeals in *Eddy vs. London Assurance Corporation* (143 N. Y., 311), which, he believed sustained his view that the provisions in the insurance policy with respect to notice of fire, proof of loss, and arbitration which apply to the insured become part of the contract with the mortgagee and may fairly be said to be applicable to any claim made against the company under the policy. In the *Eddy* case, Justice Peckham wrote: "By taking the insurance in the manner the mortgagee herein did, instead of taking out a separate policy, all the provisions of the policy, which from their nature would properly apply to the case of an insurance of the mortgagee's interest, would be regarded as forming part of the contract with him, while those provisions which antagonize or impair the force of the particular and special provisions contained in the clause providing for the insurance of the mortgagee must be regarded as ineffective and inapplicable to the case of the mortgagee."

Inheritance Tax.—The inheritance tax law of Wisconsin was sustained by the Supreme Court of that State in the following case: The principal part of the estate of George Bullen, who was a millionaire resident of Oconomowoc, was in securities which were given into the charge of the Northern Trust Company of Chicago. Some time later the trust was revoked, although the securities still remained in the vaults of the trust company. Then the Legislature passed the inheritance tax law. At the death of Mr. Bullen the heirs paid the tax amounting to \$20,000, under protest, and carried the case to the Supreme Court.

Names of Real Estate Buyers.—A law was passed by the New York Legislature requiring that the names and addresses of purchasers of real estate be placed on papers that are filed for record with the County Register. Register Griffenhagen of New York County, explaining the operation of the law, is quoted as saying: "The wisdom of the Legislature in making such an enactment may be questioned by some persons, but my belief is that the law is a good one and that it will accomplish at least the elimination of the 'dummy' in real estate transactions."

"There is also another phase of the question which must be taken into consideration. Suppose there is a legitimate transaction. The buyer does not want his name known. He consents to the insertion of a fictitious name, or connives at the insertion of a name that is not his own. He may hold the property for years, and may die. When the time comes to transfer the property to his heirs they may desire to dispose of it to settle the estate. When the time comes to make a search of the title, the title company or attorney who makes the search finds it impossible to complete the 'chain,' owing to lack of proper signatures of grantors to the deeds."

"There has been some comment on the fact that the law provides no penalty for failure to attach the proper name or for the insertion of the name and address, other than that of the real purchaser. Persons who hope to escape punishment because of this apparent oversight forget that the common law relative to fraud may be called into action and that a penalty heavier than might have been put in the law itself may be visited for noncompliance with its provisions or the insertion of a fictitious name. There have been many fraudulent deeds filed and men who think they are clever in evading punishment have swindled many persons out of money by transactions in which real estate has been the basis and in which the papers have been filed in this office. My belief is that this law is going to put an end to practice of that sort."

Innkeeper and Guest—The Appellate Division of the Supreme Court of New York State, First Department (New York City), has decided in the case of *Abraham O. Kaplan vs. Edward H. Titus*, that the relationship of innkeeper and guest does not end as soon as the latter has paid his bill and left the hotel, but that the guest has a reasonable time thereafter in which to remove his baggage, and the innkeeper is charged with the duty of maintaining the baggage in safe keeping. The court made a distinction in the two cases relied upon by the appellate, which, he showed, were not in conflict with this decision. These were *Grinnell vs. Cook* (3 Hill, 485), and *Wintermute vs. Clarke* (5 Sandf., 242). In the former the question concerned the relation between an innkeeper and a person who kept his horse in the stables of the hotel but was not himself a guest. In the *Wintermute* case the plaintiff's son took lodgings for the night and left his trunk in a place designated. He paid his bill the next morning and went to look for work, and the question as to whether he expected to return, thus continuing the relation of innkeeper and guest, was for the jury to decide. The evidence showed that he intended to keep his trunk at the hotel until he was located permanently, whether he stayed there or not.

A notable case involving the rights of a guest was decided by the United States Circuit Court for the Eastern District of Pennsylvania. This was the suit of "Battling" Nelson, the pugilist, against George C. Boldt, proprietor of the Bellevue-Stratford Hotel in Philadelphia, for damages by reason of the defendant's refusal to receive the plaintiff as a guest. The decision denied a motion for a new trial after a verdict in favor of the defendant. The Court said that the evidence reviewed by the trial judge to the jury "indicated that plaintiff, while claiming to be engaged in athletics and looking after real estate, had in fact represented himself in his own biography as the champion lightweight prizefighter of the world up to 22 Feb. 1910. It also appeared that he had engaged in nearly 100 hotly contested battles which were such as to be prohibited by the laws of the State of Pennsylvania and other States by which such contests are made a criminal offence. The Court thereupon charged that it was for the jury to say whether a violator of criminal laws of the various States, such as the evidence showed the plaintiff was, would be a reputable person to admit in a hotel in Pennsylvania under the law as previously stated, and that if the jury con-

clude he was not, he was not entitled to recover."

Finger Prints.—The first conviction in this country on finger print evidence occurred in the case of Thomas Jennings, a colored man, who was found guilty in November of the murder of Clarence A. Hiller, who was shot to death in the hall of his residence at Washington Heights, Ill., on the night of 19 September. Following the murder, the porch railing was sawed off and taken to detective headquarters, where photographs were made of the finger prints in the wet paint. These photographs were enlarged. Following Jennings' arrest, these prints were compared with new imprints of his left hand, made by the bureau of identification. An expert testified that there were 14 points of similarity of the forefinger, 11 of the middle finger, and 8 of the third finger. On the third ballot of the jurymen the sentence of death was unanimous. Counsel for Jennings asked for a new trial and a review of the case by the Supreme Court on the ground that the finger print evidence should not have been allowed.

Wife's Support by Husband—The case of *de Brauwere vs. de Brauwere*, was decided by the Supreme Court of New York in favor of the plaintiff, the defendant's wife, who was abandoned by her husband without cause, and claimed the right to recover from him amount she expended for the support of herself and her children. Justice Whitney said "Must a wife who is abandoned among strangers be ruined or starve or work herself to the bone, without hope of repayment from the husband whose legal and moral duty it is to support her? When abandoned among friends should she live solely on loans which the husband is bound to repay? If she has a little money laid up of her own, why should she not preserve her dignity by expending it until it is exhausted, without forfeiting the redress which any good Samaritan would have had if she had borrowed. When it is used up, why can she not earn more and apply it under the same protection which the law would give to money applied to the same purpose by a charitable neighbor?"

"The rule has nowhere, so far as I am aware, been applied to the case of advances by the wife herself, but being entitled to the same remedies as any other creditor, I see no reason why she should not have the same right of equitable assignment or subrogation, or whatever other equity may be the basis of relief in these cases, as any friend of hers who may have put up the necessary money."

Support of Mother-in-Law—The case of *Louise Stockey* against her husband, George A. Stockey, which came before the Domestic Relations Court of New York City, was one of a family difference which led the husband to go live with one of his relatives and his wife to remain with her mother. The evidence caused Magistrate Harris to remark: "Some women seem to think when they marry a man they can saddle their whole family on him. That's altogether wrong. A man is not obliged to support his mother-in-law. If a wife does not want to live with her husband separately, the husband is not required to support her unless she can prove that she left him because he acted improperly, or was brutal in his treatment of her. If she leaves him without cause, she must support herself."

Law Against Nagging Wives—In the action for separation brought by Mrs. Edith Y. Robinson against George L. Robinson, her husband, she accused him of treating her cruelly. Justice Crane denied the relief asked for, and said: "When the wife tantalizes the husband into a temper the resulting hasty words and violent deeds may not amount to cruel and inhuman conduct, as the law uses these words, although men agree that insults and violence to a wife are inhuman. Otherwise she would be permitted when seeking relief in court to profit by her own acts."

"I find that the plaintiff's charges are in the main true, and likewise that the provocation alleged by the defense is substantiated by the evidence. The law does not say that a man is ever justified in losing his temper and swearing at his wife, but it does say that when she comes into court asking for a separation, with support, because of such conduct, the husband may show in defense that he was nagged on and provoked by her constant aggravating and exasperating treatment until he lost his temper and said and did things he never meant or intended."

"The defendant was extremely jealous. Jealousy often thrives on mere trifles, inflamed by suspicion and imagination. Love, not hatred, is at the base of it, so that it brings an excruciating mental suffering equal to, if not surpassing, that of physical pain. If the defendant, through jealousy or hasty temper, struck the plaintiff, had she caused him no injury by rousing and goading his jealousy? Jealousy and suspicion have been the only cause of trouble between this couple. If the defendant quarrelled with his wife she provoked it; if he used improper language it was in temper which she did something to justify, if he struck her so also had she struck him, and on these occasions before he had raised a hand to her; if he pulled down pictures so did she; if he got excited and profaned, she on the other hand repeatedly refused to tell of her goings on during the day and thrice removed the defendant's money from his pocket. Such are some of the incidents in this home, from which I gather that if the defendant did use violence toward the plaintiff which unprovoked would amount to cruel and inhuman treatment, yet she also used violence toward him, excited his jealousy and helped to bring about these conditions."

"Therefore I have decided that while the defendant struck the plaintiff and used offensive language yet I will refuse her a decree of separation because of her treatment of him. The complaint I do not dismiss, but refuse the relief asked, directing, however, that defendant support his wife and child by proper allowance."

Sunday Law Decisions.—Wisconsin has a statute which forbids labor, business or work, on Sunday, except work only of necessity or charity. In the suit instituted by The Milwaukee *Sentinel* to recover on an advertising contract with the Meiselbach Manufacturing Company, the Supreme Court in December modified the judgment of the lower court by deducting the amount of certain Sunday advertising. The court said: "We are not dealing with a situation of an agreement made on a secular day for work to be done generally, nor a case of an agreement made on Sunday for work afterward done on a secular day and supported by a subsequent promise. The respondent

placed it squarely upon the right to recover for what the services performed on Sunday were reasonably worth."

The Kansas City, Missouri, Court of Appeals, likewise, in November, declared, in the case of George W. Knapp & Co., owner of *St. Louis Republic*, against Jeremiah Culbertson, president of the International Exploration Company, that newspaper contracts for advertising to be printed on Sundays were void and of no binding effect, since they were for work to be done in violation of the Sunday labor laws. This decision reversed absolutely the decision of the Circuit Court, which awarded a judgment to the *Republic*, all the judges of the court concurring.

Awards for Personal Injuries—Frederick R. King, an Oxford graduate, football and golf player, and all-round athlete, was thrown from his seat in a Chicago street car when the car left the track. Availing that his injuries prevented him from playing in golf matches and tournaments, he brought suit for \$20,000 damages and was awarded \$1,000.

Mrs. Emma M. Libaire, formerly soloist at the West End Synagogue in New York City, nearly lost her life in an automobile accident, when an express train on the Minneapolis and St. Louis Railway Company crashed into the machine in which she was being driven over a crossing at Cottage Wood Station, St. Paul. She sued for \$25,000 for the injury to her voice, and recovered \$11,500. She testified she had been earning \$3,000 a year singing at the synagogue and at weddings and private entertainments.

Mrs. Frieda Lazarowitz obtained a verdict for \$3,000 against Dr. Phillip Sussman of Brooklyn for the death of her son, which was caused, she alleged, by the doctor's careless use of chloroform. The boy had been injured in a street car accident and suffered from a swollen knee. Refusing to allow the use of leeches, the boy also fought against the doctor's efforts to chloroform him, until the doctor—so she testified—poured the chloroform down his nostrils, and he died. The doctor's defence was that the chloroform was administered in the ordinary way, and that the boy's death was an unforeseen calamity.

The Election Law.—Michael Enners, residing at 962 3d avenue, New York, on election day, having moved there on 1 November, voted from his former residence at 811 3d avenue, where he had duly registered. He was challenged and arrested at the instance of the election inspector. On the trial, witnesses testified to the man's honesty, and Magistrate House said: "If I possessed the law-making powers in this State I would pass a statute making repeating and other wilful offenses against the election laws the same as treason and punishable by death. But when it comes to splitting hairs about a man's residence the courts and the laws seem still up in the air. The Appellate Division has failed to define what a man's voting residence or domicile is. If that high court cannot reach any decision in the matter certainly a humble magistrate should not take it upon his shoulders to define the law."

"It may be recalled that when Theodore Roosevelt was proposed as the candidate for Governor in this State question arose as to whether his legal residence was in Washington

or at Oyster Bay. Senator Elihu Root then came forward and managed to split the finest imaginable hair so adroitly that Mr. Roosevelt's residence was established at Oyster Bay.

"In this case the prisoner is an honest man, proud of his franchise. His intentions to vote here were unimpeachable, so I hold that when a man only votes once and votes with honest intentions his residence is the place he intends as his residence when he votes. The prisoner is discharged."

Juries May Read the Newspapers—The United States Supreme Court in October held that a man's constitutional rights are not necessarily violated if a jury which is trying him on a charge of taking the life of another is allowed to separate and to read newspapers during the trial. The Court held similarly in regard to the refusal of a judge to send a jury out of the courtroom during arguments on the admission of evidence. And the further rule was laid down that the act of requiring the accused to put on a coat alleged to have been worn when the alleged crime was committed did not amount to "requiring the prisoner to testify against himself."

These decisions need not necessarily affect the procedure governing murder trials where it is the practice to keep jurors together and not permit their access to newspaper reports of the trial.

Disfranchising the Negro—The so-called "grandfather law," passed by the Maryland Legislature in 1908, and applicable to the municipality of Annapolis, was held unconstitutional by the Circuit Court of the United States, because it conflicted with the Fifteenth Amendment and practically barred negroes from voting at local elections. Judge Morris who rendered the decision cited many authorities bearing on the limitation of the power of a State in providing qualifications for voters. He ruled that the Annapolis act, like all the other disfranchising devices, was a blow at the negro race as a race, when it laid down the qualification that a voter to be accepted by the registers of election must have had the right to vote prior to 1 Jan. 1868, or must show descent from a person having that right. Only white persons were permitted to vote in Maryland before 1 Jan. 1868, so that the restriction was necessarily based on race and color. He also disposed of the argument that the guarantee of the Fifteenth Amendment to the Federal constitution extended only to "federal" as distinguished from state, county, and municipal elections. This is the first time any Federal court passed directly on a restriction intended to deprive the negro as such of the suffrage.

The Intermarriage of Blacks and Whites—The interpretation of the statutes of Southern States relating to marriages between blacks and whites was the question before the Supreme Court of North Carolina in a suit to annul a marriage under the statute providing that a marriage between a white person and a person of negro descent to the third generation inclusive shall be void. The case was that of *Ferrall vs Ferrall* (69 S. E., 60). The Court holds that to render a marriage void the negro ancestor of the third generation must be of pure negro blood and not one who has his status as a negro fixed and ascertained by the recognition and general consensus of the neighborhood where he lives. The statute in question, which is part

of a section revised in 1905, headed "Who May Not Marry," applied either to a negro or an Indian to the third generation inclusive, and this or an enactment expressed in similar terms has long been the statute law of the State governing questions of that character, and the courts have always held that to bring the marriage within the prohibited degree one of the ancestors of the generation named must have been of pure negro blood.

The *Law Review*, commenting on this case, says that most of the statutory definitions of the word "negro" are broad enough to include an octoroon, as in the statutes of Florida and Alabama, but whenever the question has been considered by the courts independently of statutory definitions they have been in accord with the principal case (*Felix vs State*, 18 Ala., 720; *Monroe vs Collins*, 17 Oh. St., 665). Statutes of other States where there is no arbitrary definition of the word "negro" invariably add "or mulatto," "or person of negro descent to the third generation inclusive." In Virginia "negro" and "colored person" are used interchangeably and defined by statute as "a person with one-fourth or more negro blood." The decision, furthermore, is sustained by the rule that penal statutes are to be construed strictly in favor of the accused.

The *Harvard Law Review* mentions a recent decision by the Supreme Court of Louisiana, where, in *State vs Treadway* (52 So., 500, La.) the court rules that an octoroon or person having one-eighth negro blood is not a person of the negro race within the terms of the statute making concubinage "between a person of the Caucasian or white race and a person of the negro or black race" a felony.

In the *Ferrall* case, the Court referred to *Hare's case* (113 N. C., 10 S. E., 55), which involved the right of an applicant to be admitted to the white schools. The statute providing separate schools for the two races at that time defined the status of a rightful applicant in terms applicable to the law as to marriage, and it was held that the ancestor of the third generation whose blood should determine the issue must have been of pure negro blood. The Court said in that case that the words "the third generation inclusive" must be construed to prohibit intermarriage of whites with persons who are not beyond the third generation or in the fourth generation from the pure negro ancestor.

Again in the *State vs. Chavers* (50 N. C., 11), involving the construction of a statute defining free negroes as "all free persons descended from negro ancestors to the fourth generation inclusive," the court approved a charge that "every person who had one-sixteenth negro blood in his veins was a full negro within meaning of the statute" and declared that "no person can cease to be a negro unless he had reached the fifth generation from his African ancestor." A similar principle of construction has been established by authoritative decisions in Virginia and Alabama.

The court says nothing is found to the contrary except a recent decision of the Supreme Court of the District of Columbia in *Isabel Wall vs James Oyster et al.*, a case not yet reported, which was procured for the North Carolina court by counsel. That case involved the construction of a statute of Congress providing for separate white and colored schools

LEGISLATION—LEPROSY

in the District, and arose on mandamus proceedings to compel the Board of Education to enroll the petitioner in a white school, the admission being made that the petitioner had not less than one-sixteenth negro blood. The application was denied chiefly on the ground that Congress had not undertaken by enactment to define "what race or what percentage or proportion of racial blood shall characterize an individual as colored, the term, being without legislative definition, is left to the import ascribed to it in the common parlance of the people." Applying this rule the court held that the applicant must be considered a colored child within the meaning of the statute.

The North Carolina court says that if the District of Columbia decision was in direct contravention of the principles obtaining in that State it would not justify the court in departing from a line of precedents long recognized as authoritative and controlling, but "it will be noted that the language of the statute is very general in its terms, 'white' and 'colored' schools, and on that very account the common parlance of the people was allowed to prevail and the case therefore presents a very different question from the one we consider in construing a statute which defines status as 'a person of negro or Indian blood to the third generation inclusive.'"

The court adds: "In this connection an interesting compendium of the laws of the Southern States on this subject was furnished us by defendant's counsel, showing that the four States of Alabama, Tennessee, Maryland, and North Carolina make substantially the same provision with reference to these marriages, and that all of them have regulations on the subject in terms equally specific and definite."

Legislation, Uniform, See UNIFORM LEGISLATION.

Lehmann, Frederick William, American lawyer b in Prussia 28 Feb. 1853. He was graduated from Tabor College, Iowa, A B 1873, and the same year was admitted to the bar and established himself in practice in Nebraska City, Neb. In 1876 he removed to Des Moines and continued his practice there until 1890 when he became junior member of the firm of Boyle, Priest and Lehmann at St. Louis, Mo. In 1895 the firm name was changed to Priest and Lehmann and in 1905 to that of Lehmann and Lehmann. He became one of the most distinguished lawyers of the Southwest and was appointed government delegate and chairman of the committee on plan and scope at the Universal Congress of Lawyers and Jurists held at St. Louis in 1904. He was also chairman of the commissions on Congresses and anthropology of the Louisiana Purchase Exposition Company; president of the St. Louis Public Library; chairman of the board of Freeholders of the City of St. Louis, and president of the American Bar Association, 1908-09. On 3 Dec 1910, Mr. Lehmann was appointed by President Taft to be Solicitor-General of the United States, to fill the vacancy caused by the death of Lloyd W. Bowers. This office, one of the most arduous in the Department of Justice, presents most of the difficult government cases to the United States Supreme Court, and Mr. Lehmann, in this office joins with Judge W. S. Kenyon, assistant to the Attorney-Gen-

eral in the preparation of corporation cases and in the enforcement of the Sherman anti-trust law, notably that of the beef trust, in which case Judge Kenyon has already succeeded in procuring many indictments.

Lenihan, Mathias Clement, R. C. bishop. b. Dubuque, Iowa, 6 Oct 1854. He attended St. John's College, Prairie du Chien, Mo., 1870-73, and St. Joseph's College, Dubuque, Iowa, 1873-76, and was graduated in theology from the Grand Seminary of the Sulpicians, Montreal, Can., in 1879. He received his minor orders from Bishop Hennessy, at Dubuque, and was ordered deacon by Archbishop Bourget of Montreal, and ordained priest by Bishop Lefevre, at Montreal. On 21 Sept. 1904, he was consecrated bishop of the newly formed diocese of Great Falls Mont.

Lenorson Memorial. In Oct 1910 a commemorative tablet in honor of Samuel Lenorson was dedicated at Worcester, Mass. Lenorson, when only 14 years of age, distinguished himself for remarkable bravery in connection with the Indian outrages against the early colonists. In company with Mrs. Hannah Dustin and Mrs. Mary Neffe he escaped from captivity near Concord, N. H., in 1697. Prominent mention has been given in history both to Mrs. Dustin and to Mrs. Neffe, and many memorial tablets to their bravery have been erected in different places, but heretofore young Lenorson's part has been entirely overlooked. The two women and Lenorson were captured, together with 13 other whites, by a marauding band of Indians. For six months they were forced to travel with the latter, suffering terrible hardships and indignities all the way. Finally, on 30 April 1697, they contrived to arm themselves with some of their captors' tomahawks and, in a hand to hand fight, killed 10 of them and made good their escape. The Worcester tablet to Lenorson is placed on a tower at Lake Park, marking the site of the home from which he was stolen by the Indians. The inscription recites briefly the story of his abduction and escape.

Leprosy. The recent admission of Mrs. Iris Lee, a negress, aged 22 years, to the Metropolitan Hospital on Blackwell's Island marks the first case of leprosy in a female to be treated in that clinic. Last year, there were altogether nine deaths from this disease in the United States, all of these contracted in foreign countries. There is no indication whatever that it will spread or become in any way epidemic; such is, in fact, an impossibility. Regarding the case of Mrs. Lee, one interesting point is that her little son, aged three, who has been in close communication with his mother throughout his life, shows no sign of leprosy. This is important, as affecting the question of heredity and infection. Mrs. Lee was born in the British West Indies, but has lived for the past five years in New York. When found, she was destitute and almost starving.

Dr. David G. Walters, president of the Hawaiian territorial Medical Society, has recently declared that a positive cure for leprosy has been found, and that, within a few years, the disease will be cured on a large scale in tropical countries. The cure is being developed under commission sent to Hawaii

by the Federal Government to aid the local investigators. This Commission consists of Doctor Brinckerhoff, now of Harvard, Doctor Currie and Doctor Hollman. This Committee has been working for four or five years along the lines laid down by Moses T. Clegg, of Manila. Taking Mr. Clegg's work as a scientific beginning, the Federal Commissioners have worked on the serum theory of treatment. The results of these investigations are impatiently awaited by the medical world.

Leprosy is so rare a disease in this country that opportunity is seldom given to American physicians to see several cases together and study the symptoms in detail. Such an opportunity, however, occurred during Dec. 1910, when 11 lepers were brought to New York and subjected to the inspection of a group of doctors, after a lecture had been delivered upon their condition. This occurred at a special session of the dermatological section of the Medical Society. It was stated at the time that more than 30 lepers were known to exist in New York City, but resolutions were passed, condemning the public fear of this disease, which is not infectious in this climate as the majority suppose. It was stated by those physicians who had had a large experience with the disease, indeed, that the chance of infection in New York would be about as great as throwing a lighted brand into a pile of sand,—the climate representing the sand.

In other words, the disease is comparatively harmless, from the point of view of infection.

The attendant physicians, however, declared in favor of a "National Leprosaria," with stations in Florida and San Francisco,—urging in favor of such an institution that it was impracticable for the States to take action on account of the small number of cases in each State, and it was unfair, from a national standpoint, to allow one State to drive its lepers across the border into another State.

There are now on record, 278 cases in the United States,—176 of them being men and 102 women. Five seaboard States contain almost all of the recorded cases,—New York, South Carolina, Florida, California, and Massachusetts, leading in the order named.

In historical sketches dealing with the growth of leprosy in the United States, it has been asserted that slaves brought it into the South, the Chinese immigrants into San Francisco, and sailors from all over the world into the old sailing-ship ports of New Bedford and Boston. In reality, the cause of its appearance in this country is unknown.

Dr. Charles W. Duval, of Tulane University, recently, discussed leprosy from a viewpoint that other doctors have said was epoch-making. He described his experiments in segregating the bacilli of the disease and his final success in propagating the germs of a culture fluid outside of a human body. He said that no other experimenter had succeeded before him, and that his work gave promise of what could be achieved, if the Government would take hold of the problem and afford opportunities for treatment and real scientific study.

One result he had found explained to him the reason why leprosy has remained throughout the ages the most persistently infectious of all the diseases and the hardest to cure and eradicate. He found that while typhoid germs

and tubercular germs died in a very short time after being segregated from the body on bits of skin, the germs of leprosy lived on, year in and year out, and he could propagate them by introducing them into cultures fifteen months after they had been removed from infectious patients. Until he learned this characteristic, it had always puzzled him, to explain how one infected family could move out of a dwelling and another become infected, which might move in many months afterward.

Dr. Isadore Dyer, of New Orleans, in outlining what the nations are doing to control the leprosy situation, said that Mexico was the most backward, and Russia was well ahead. China, recognized everywhere as the original home of leprosy, was rapidly improving its methods of handling lepers, and was succeeding splendidly in colonizing plants.

From this it will be apparent that considerable progress is being made in the fight against this disease.

Leschetizky, Theodore, Polish composer: b. near Lemberg, Poland, 22 June 1830, on an estate belonging to a branch of the Potocki family, his father, Josef Leschetizky, having come from Bohemia to act as music master to the young countesses Potocki, and, marrying Thérèse Von Ullman, a lady residing in the vicinity, was established by the Potocki in a wing of the castle of Lanent. Theodore Leschetizky attended St. Anne's School in Vienna, entered the gymnasium of the Benedictine Fathers in 1840, and entered upon a musical career, making his public debut at Lemberg at the age of nine, where he played Czerny's concertina with orchestra under the direction of Wolfgang Amadeus Mozart. He studied under Karl Czerny, gave music lessons and played at numerous concerts, although but 14 years of age. In 1848 he went to Italy, and, in 1852, to St. Petersburg, Russia, where he appeared before the court of Nicholas I. He became concert master at the court of the Grand Duchess Helen at St. Petersburg in 1855, and in 1858 was appointed by the Empress Maria Alexandrovna musical instructor at the Smolna Institute, and it was his private pupils that formed the nucleus of the St. Petersburg Conservatory of Music, founded in 1862. In 1874 he received the Franz-Josef order from the Emperor of Austria, then on a visit to St. Petersburg. The other decorations which have been given him are the Anna and Stanislaw orders, the Gustav Vasa and the Rumanian Order of Commandeur. In 1878 he returned to Vienna, and engaged in teaching, having among his pupils Ignace Paderewski, who became celebrated as a pianist and composer. Leschetizky was instrumental in founding the now celebrated Tonkünstlerverein in Vienna and on 4 March 1887, he terminated his virtuoso career at Frankfort-on-the-Main, playing the E flat concerto by Beethoven under the direction of Desshof. He left the Catholic Church because by its laws a divorced man was debarred remarrying and became a Protestant, but he speaks of the Catholic as the most poetic of religions, the best suited to an artistic nature and the developer in many ways of music. His genius is not confined to music, as he is a connoisseur of painting and a student of poetry, history and politics. Leschetizky's is primarily a school of virtuosity—brilliantly veloc-

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ity, authoritative effects being insisted upon; for, as he once remarked, "the pianist's art is akin to the actor's; the piano should be used declamatorily; the pianist must speak." His compositions include, 'Souvenirs d'Italie,' (6 pieces); 'Suite à la Campagné,' 'Menuetto Capriccioso, the second Nocturne,' and 'La Petite Coquette' (op. 12), 'Souvenir de St. Petersburg' (op. 15); 'Les Deux Alouettes' (op. 22); 'Valse Chromatique, Mazurkas' (op. 244). He also produced an opera 'Die Erste Falte' (Prague 1867, Wiesbaden 1881.)

Levy Memorial. A number of wealthy American Jews have begun a movement for the erection in Washington of a statue in memory of Commodore Uriah P. Levy, an officer in the United States navy from 1812 to 1862. Jefferson M. Levy, of New York City, a grandson of Commodore Levy, is the leader of the movement. Considerable sentiment attaches to the person of Commodore Levy among the Hebrews of this country because of the Dreyfus-like rôle which the officer was forced to assume through practically his entire period of service. Holding advanced ideas on the practice of flogging as a punishment and on the general consumption of "grog" by the sailors, he was made the object of a vindictive attack by a naval cabal composed of officers who favored the retention of the almost barbarous discipline of the early days of the navy. This attack was embittered by the fact that Commodore Levy was a Jew, and for many years he was a social pariah in naval circles. Commodore Levy died in 1862, and is buried in New York City. He is credited with being the father of the movement which ended in the abolition of corporal punishment in the navy and on his tombstone is an inscription to this effect:

Liability. See EMPLOYERS' LIABILITY.

Liberia. A partial Republic situated on the west coast of Africa, extending between Sierra Leone and the Ivory Coast, and inland as far as 200 miles in some places. The coast line of Liberia is about 350 miles long.

Area and Population.—The total area of the country is put at 40,000 square miles, but the part under direct governmental administration is probably not more than 7,000 square miles in extent, and is all coast territory. The whole population is estimated at approximately 2,000,000. Most of the natives belong to the Kru tribes, and are pagans; there are a few Christians, however. American Liberians number about 3,000; and Europeans about 100, and they are principally of Protestant Christian faiths, there being American missions in the country. The capital town and the principal port is Monrovia, and it has (1905) 8,000 inhabitants. Other ports are Cape Mount, Grand Basa, River-Cesa, etc.; other towns, Royesville; Marshall, Arthington, Careysburg, Millsburg, Whiteplains, and Rocktown.

Government and Education.—The settlement of Liberia by American and European colonization societies in 1822 was undertaken in an effort to provide a suitable habitat for the oppressed Afro-American slave. The Republic of Liberia was created in 1847, and received Britain's recognition. The Constitution of the United States was patterned after. There is now a President in the Republic, a

Vice-President, a Council, and a Legislature consisting of the House of Representatives and the Senate. Negro landowners only are entitled to the franchise. The coast territory is divided, for purposes of administration, into four counties, under superintendents. There is a government college in the country, with 12 professors and 120 students. In 1903 there were 110 primary schools, with 110 teachers and about 4,100 pupils, receiving government support. There are almost 100 mission schools throughout the Republic, giving instruction to 3,000 pupils.

Revenue, Expenditures, and Debt.—The receipts of the Government for 1908 aggregated about \$415,000, and the expenditures to about \$380,000. Customs duties provide the greater part of the revenue; taxes on rubber, and an emigration tax, also assist. The total external debt amounted in 1909 to \$881,250, the internal debt to about \$135,000.

Production and Industry.—The soil of Liberia is very fertile. Agriculture, however, is in its infancy. The forests are rich in various woods, but they have not been worked. Among the products of the soil are palm kernels, kola nuts, chillies, beni seed, anatto seed, cocoa, cotton, coffee, piassava fibre, and other articles. A company has control of the rubber industry of the Republic, which is yet immature. The mineral resources comprise copper, zinc, lead, bitumen, and iron—the latter being mined, and gold and diamonds are found. The resources of Liberia have been neglected heretofore, but companies are now taking up the work of the country's agricultural and industrial development in earnest.

Commerce and Communications.—The imports were valued at \$720,000 in 1908, and the exports at \$13,540. The former consist chiefly of cottons, provisions, fish, wood-work, prints, clothing, boots, hardware, and spirits; the latter of rubber, palm oil and kernels, cocoa, coffee, ivory, ginger, and piassava fibre. The exportation of rubber in 1909 was about 180,000 pounds. Liberian trade with Great Britain is paramount; with Germany important. A chartered company has built a good road about 20 miles into the interior of the country. There are no railways or telegraphs. Most of the traffic is done by boats and ox-carts. The ports were visited in 1907 by vessels registering 727,000 tons. British, German, French, and Spanish vessels call at the ports of Liberia.

History, 1910.—An agreement was reached in Nov. 1910 between the United States, Great Britain, France, and Germany, according to which the United States was to be permitted to save Liberia from bankruptcy, with the assistance of the other three powers named. This proposal was made in July but was only acceded to after considerable diplomatic parlay. The original proposal was that the United States take over the customs for its protection in paying Liberia's bills, but France objected to this as an infringement of its rights under its Liberian treaties of 1802 and 1907. Negotiations followed in which England, as the owner of the adjoining country, and Germany took part.

Under the agreement Liberia is not to lose its rights of sovereignty, but at least temporarily disappears from the diplomatic field, being

represented by the United States. The four powers agreed to arrive at an understanding with a view to assisting Liberia to the unification and liquidation of its debts, and the organization of its financial control in common with its customs. By this arrangement France's interests will be protected. France has a frontier of 620 miles adjoining Liberia.

A problem almost as serious as its economic and diplomatic relations presented itself in the troubles arising from the many interior tribes inhabiting the country. On that account, the United States Government was asked to assist in the organization of a large police force under Liberian authority. Before acceding to the request the War Department assigned Lieut. Benj. O. Davis, a colored officer, to investigate conditions in Liberia, and report. Lieutenant Davis, who served as first lieutenant in the 8th United States Volunteer Infantry during the Spanish War, and later served in the ranks in the 9th Cavalry, was promoted to the rank of second lieutenant and later first lieutenant on account of ability. If the police force is organized under American direction, Lieutenant Davis will probably be assigned to the task.

Libraries, Public, Ventilation of. Dr. W. A. Evans, Health Commissioner of Chicago, advises that the air of public libraries should be clean enough for the books and at the right humidity. The temperature in the general reading room must be about 65 degrees,—which is best suited for quiet, inactive people with low heat production, and a tendency toward cold feet; for convalescents from various diseases visit public libraries. Vacuum cleaning of the books and shelves has great advantages. To take each book and wipe it off with a damp cloth, then to wipe off the shelf and replace the books entails large expense.

If the library ventilates by open windows they should be covered with cheese cloth fitted to the windows in frames and these cloths should be easily removable so that they can be cleaned and replaced with little expense or trouble. If the air is artificially introduced it should be washed or filtered through cheese-cloth. Fresh air should be introduced low down at a temperature of 60 to 65 degrees, and at a low velocity. The outlets should be high up. If the ventilation is by gravity the air should enter the room through radiation so as to bring the air to at least 55 degrees when it enters the general air supply of the room. If this is not feasible, then deflectors must be inserted in or near the window openings in cold weather, so as to send the cold air to the ceiling that it may be warmed before it reaches the floor.

Doctor Evans further develops his doctrine of ventilation as follows: "There are a few things in a library management or arrangement which can be done to lessen the danger of contagion. Periodic blowing out of the air of the room will do much toward keeping the bacterial content of the air low. To provide sunshine will lower the bacterial content of the air of the room. To keep the air of the room fresh will lower the danger of infection of the occupants of the rooms. To place the reading tables and chairs so that the readers will have their backs toward each other rather than facing each other across tables will decrease the danger of infection. Several plans

are available for the disinfection of returned books in a circulating library. Exposure to the sun's rays is effective and practicable in small libraries.

"As the stack room is used by but few people, good ventilation is not as necessary as in the reading room. If ventilation is by windows, the aisles should be so arranged as to make the best possible use of the windows. If the ventilation is artificial, the ducts should be carried under the stacks and the air introduced from under them. Something can be gained in keeping dust off the books by having the stacks made with cloth backs instead of wooden backs, in order that the air getting into the shelf space will have its dust filtered out. To prevent dampness penetrating to the books, they should be kept away from outside walls."

Library of Congress. See CONGRESSIONAL LIBRARY.

Life Insurance. See INSURANCE, LIFE.

Life, Origin and Creation of. The question of the origin of life is one which has attracted men's minds for many years. The theory of "spontaneous generation," held today by Professor Hæckel, of Jena, and numerous other scientific thinkers, is very old, but is now becoming more and more discredited, as all experiments in this direction have failed. (The most recent attempts will be enumerated immediately.) As to the origin of life. There was the theory, first advanced by a French writer, Count de Salles-Guyon, and defended by F. Cohn, Helmholtz, and Lord Kelvin, that life never had a beginning *on our planet*. It was conveyed hither on particles of meteoric dust. It was soon pointed out, however, that this did not really solve the problem of the *ultimate source* of life, it merely pushed it back "one step." M. Verworn considered the hypothesis of "cosmic germs" as inconsistent with the laws of evolution, and L. Errera pointed out that the necessary conditions for life were lacking in interplanetary bodies.

Next, Du Bois-Reymond's theory held the attention of the scientific world. It was the theory of "cosmic panspermia," somewhat similar to that mentioned above. W. Preyer was forced to the conclusion that "Life. . . must have subsisted from all time, even when the globe was an incandescent mass."

Realizing the immense difficulties in the way of the theory of "spontaneous generation," many biologists have attempted to solve the problem by creating life artificially in the laboratory; for, if once such an experiment could succeed, it is obvious that there would no longer be any *a priori* objection to the hypothesis that Nature created life at some time in the past, spontaneously. Of late years, experiments in this direction have, accordingly, been repeated, with more *apparent* success than those conducted earlier in the century.

It is commonly supposed that Prof. Jacques Loeb was successful in creating life from the not-living; but this is a mistake. He proved (1) That the eggs of the sea-urchin can be fertilized artificially (that is, without the male principle); and (2) that the human heart can be made to contract and expand without any mysterious "nervous impulse" from the brain or spinal cord. But, in the first place, we have an egg previously laid by a living creature—

which is a very different thing from an inorganic substance,—it was merely “quickened into life” by artificial means. And much the same may be said of his experiments on the human heart. So long as vitality remained in the heart, after its removal, chemical salts caused its contraction and expansion, but once completely dead, this no longer took place. It will be seen this is completely different from any successful “creation of life.”

More recently, Prof Butler Burke, of Cambridge, England, caused a sensation by asserting that he had succeeded in creating minute organisms—which multiplied and showed every indication of life—from sterilized bouillon when acted upon by radium. He called these little creatures *radiobes*. It was soon proved, however, that radium was not necessary for their production; and then, that these were not bacteria, or any form of living matter at all; but rather vito-chemical compounds, having many of the appearances of life. Professor Burke's experiments were thus shown to be inconclusive.

The most important work in this field, is, doubtless, that of Dr. Charlton Bastian, of London, who obtained bacteria of various kinds from tubes, into which he had placed chemicals (previously cleaned) and distilled water. The liquid was then heated to the boiling point, and, when steam was issuing from the tubes, they were sealed hermetically. They were then immersed in an oil-bath for twenty minutes, at a temperature of 260°F, after which they were taken out and placed in diffuse daylight for two days. At the end of that time, the tubes were broken open, and bacteria, torulæ, etc., were found inside.

For various reasons of an intricate character, these experiments have not been considered conclusive, however, and it is still believed that no successful attempts have, as yet, been made in the creation of life from the not living. Bastian's are the latest and most conclusive experiments so far conducted. Their inconclusiveness would seem to indicate that only continued failure can come from experiments such as these—and this is the belief of the majority of biologists of the present day.

Bearing on this question of the ‘creation’ or origin of life are some recent experiments, tending to show that a resuscitation of animals may sometimes be effected, when they are (apparently) dead. It is uncertain, as yet, how far these experiments may be carried with success—how long an animal may be “dead,” in other words, and yet brought back to life. But it is obvious that, if this has been accomplished, even after a short period, it will throw considerable light on the nature of life and its manifestation in the body.

Dr Louise G. Robinovitch has lately performed a number of experiments of this character, in which “electric resuscitation” as she calls it, has been successful after an animal has been killed by an electric shock. A rabbit was used for the experiments, from which the hair had been shaved on the head, breast and back. The animal was then killed by means of an electric shock, and was pronounced “dead” by several doctors who examined it.

An electrical apparatus, so adjusted that it makes and breaks the circuit about 12,000 times

a minute, was then used. It was controlled by means of a switch. By opening and closing the switch a number of times in rapid succession, the heart and lungs were forced into activity, and the animal lived and breathed.

If successful, it is intended to install a number of instruments of this character in hospitals, for the treatment of those who have been shocked to death by means of electric currents, and it will doubtless prove of great utility in the future.

The principle upon which the method is based is that of the contraction of muscles, when a current of electricity is applied, and its relaxation when the current is shut off. The heart and respiratory muscles are contracted and relaxed in alternate applications of the current, and, where vitality still exists, it is excited into natural action. Without this vitality, as in cases of “absolute” death, the method is, of course, of no benefit. See CELL.

Prof T. Wood Clarke, writing in a recent number of *Science*, says

“Recent investigations on the part of certain physiologists and histologists tend to throw some new light upon perhaps the greatest of all scientific and philosophical questions, the problem of life and death. Whereas, until recently, the transition from the state of life to that of death was considered, at least by the medical and legal profession, to occur at the moment when the heart stopped beating, recent observations tend to show that besides this general conception of life and death, there exists, also, an entirely different form of life, an elemental life of the tissues, which under certain conditions may continue for long periods after the general life of the animal has ceased, after the heart has stopped beating, and the personality of the individual has been lost. The elemental death begins, under normal conditions, promptly after general death has occurred, and is caused by the two factors of bacterial invasion and ferment activity, the change manifesting itself in loss of cell tension, and alterations in cell form, the first steps towards putrefaction and dissolution. If however, immediately after general life has ceased to exist, fragments of tissue are removed from the body, and placed in such a condition as to prevent bacterial or ferment action, the elemental life of the tissue may be maintained over long periods of time. Such a life is latent; it shows no signs of vital activity; upon such a piece of tissue being replaced in the animal body and its nutrition being maintained by a renewal of the circulation, life again becomes manifest, and the tissue renews its functional activity as a part of the living organism.

Such latent life may be of two types, potential life and unmanifested actual life. In the first condition metabolism is completely suspended as in the case of seeds, kept at a very low temperature. Its application in animal life is not absolutely proved, and it is of greater theoretical than practical importance. Unmanifested actual life, however, was shown to be possible by Loevenhoeck in the case of *Milnesium tardigradum*, an animal organism which renewed its life after a long period of complete dryness. This form of latent life has been used extensively by Carrel in his work on transplantation of arteries and organs. It is the condition which normally exists immedi-

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ately after general death and continues until bacterial and enzymotic action reduces elemental death. Normally it lasts but a few hours at the most, but may, by strict asepsis, and continued temperature between 0°C and 1°C . (32°F and 33.8°F) be maintained for weeks or months. It is not a complete suppression of metabolism, but is Metabolism reduced to an inappreciable minimum, to so low a grade that the changes produced are not sufficiently destructive to prevent the revitalization of the tissues

Until recently these two types of latent life were considered to be the only forms of life which could be maintained outside of the animal body after general death. Stimulated, however, by the work of Harrison, who, a few years ago, grew nerve cells of embryo frogs in a drop of plasma, Carrel and Burrows, of the Rockefeller Institute for Medical Research, have recently carried out experiments in producing actual manifest life in adult mammalian tissue. Their brilliant results are reported in brief preliminary notes in the *Journal of the American Medical Association* for 15 and 29 Oct 1910. The principle of the experiments was extremely simple. The technique was rendered possible by the careful organization of the department of experimental surgery of the Rockefeller Institute. The experiments consisted in removing bits of tissue from mammals immediately after killing them, the most minute precautions being taken to procure asepsis, inoculating the tissue into a drop of plasmatic medium made from the same animal, sealing it in a hanging drop slide, placing it in a thermostat at 37°C . (98.6°F .) and observing the changes in the tissue by means of a microscope enclosed in a warm chamber kept at the same temperature.

The results of the experiments were uniform. In every case after from one to three days, growth of the specimen was observed. After a period of quiescence, varying according to the nature of the tissue, granulations made their appearance, at the margin of the tissue fragment, spindle and polygonal cells were formed and rapidly grew out into the surrounding lymph. The new tissue had many characteristics of the parent material; cartilage reproduced cartilage; spleen formed cells closely resembling splenic pulp; and, most striking of all, from the surface of bits of kidney, grew tubules, replicas of the normal kidney tubes. Once started, the growth went on with wild rapidity, the cells branching out in all directions, and the process continuing for days until the nutritive power of the plasmatic medium was exhausted, and then when once stopped by inanition, immediately becoming re-activated, upon reinoculation into fresh plasma. Furthermore, fragments of the newly formed tissue removed from the parent mass, and placed in fresh media, continued the same active prolific growth as before its separation, the second generation of cells closely resembling the first.

The speed of growth of the tissues varied according to the nature of the material; cartilage began to grow after three days, and progressed slowly; peritoneal endothelium and arterial sheaths were also slow in starting and sluggish in progress; thyroid and spleen were more active, showing changes in from thirty

to forty-eight hours; while in the case of kidney, proliferation was seen after twelve hours in the thermostat. Most interesting of all, however, was the behavior of tumor tissues. In their first article, the authors report definite growth of a bit of chicken sarcoma after nine hours, and in the second publication a specimen of the same tumor had been seen actively growing two and one-half hours after inoculation. Still another specimen of the same tumor, on being measured twenty-four hours after inoculation, was found to have increased in size fourteen fold, and after forty-eight hours twenty-two fold; the changes being plainly visible to the naked eye

It is impossible at the present time to estimate the value of these observations. From the viewpoint of the biologist, the production of active manifest life—for where there is cell proliferation and growths there is manifested an active life process, is of infinite academic interest. From the philosophical standpoint a new factor is added to the great problem of life and death. To the mind of the experimental worker in medical science, an entirely new field in possibility is thrown open for the study of cancer. Now that it is possible actually to see tumor cells grow, and to study directly the various factors which stimulate or retard that growth, it is not extravagant to say that a gigantic stride has been taken towards the discovery of the cause of cancer, and the ultimate goal of its prevention and cure.

Life-Saving Corps, United States Volunteer. The United States Volunteer Life Saving Corps has 2,000 patrolled stations and 22,000 enrolled members, all expert swimmers, yachtsmen and boatmen, with about 6,000 boats, from dories to extensive sail, steam, naphtha and gasoline launches. It has saved in Greater New York, approximately, 268 lives; rendered "first aid" in 747 cases; assisted 423 people on the water, and assisted 195 boats in distress. The corps is well organized in New York State, Massachusetts, Connecticut, New Jersey, Maryland, District of Columbia, Pennsylvania, Kentucky, and other States as far west as California. It has been giving free instruction in swimming in both male and female departments of all the public free baths of Greater New York—1,700 persons having been taught during the season of 1909, and has built 14 life-saving stations, one dock, and placed 45 life boats throughout the Greater City. The corps furnishes its various crews, free of charge, according to the funds available for the various districts and departments, ring life preservers, metallic life preservers, ice balls, medicine chests, flags, signs, charts, and boats, and builds life-saving stations at the most dangerous points. It is supported wholly by voluntary contributions, with the exception of the departments of Greater New York and Rhode Island, which are aided by appropriations from the cities and States, respectively. The department of Greater New York is particularly well organized, and is divided into 16 commodores and 48 vice-commodores districts, containing 700 patrolled stations, with 7,200 members, and 1,200 boats devoted to its life-saving work.

Life-Saving Service, United States. The ocean and lake coasts of the United States are

LIFTING MACHINES—LIGHTNING AND DEATH BY LIGHTNING

picketed with stations of the life-saving service attached to the United States Treasury Department. Summer I Kimball is general superintendent, with headquarters at Washington, and there is a corps of inspectors, superintendents, station keepers, and crews, extending over the entire coast line, together with a Board on Life-Saving Appliances, composed of experts selected from the Revenue Cutter Service, the Army, the Life-Saving Service, and civilians. At the close of the last fiscal year the life saving establishment embraced 281 stations, 201 being on the Atlantic Coast, 60 on the lakes, 19 on the Pacific Coast, and one at the falls of the Ohio, Louisville, Ky. The following are the statistics of the service for the year ending 30 June 1910: disasters, 417; value of property involved, \$10,989,095; value of property saved, \$9,286,260; value of property lost, \$1,702,835; persons involved, 3,648; persons lost, 39; shipwrecked persons succored at stations, 327; days' succor afforded, 830; vessels totally lost on United States coasts, 48. Since the introduction of the life-saving system, in 1871, to 30 June 1910, the statistics have been as follows: Disasters, 21,250; value of property involved, \$293,033,154; value of property saved, \$234,985,892; value of property lost, \$58,047,262; persons involved, 146,093; persons lost, 1,277; shipwrecked persons succored at stations, 22,973; days' succor afforded, 52,535.

Lifting Machines. See BALLASTING MACHINE.

Lighthouse Board, United States. In the report of the Bureau of Lighthouses for the fiscal year 1909 reasons were presented in advocacy of the reorganization of the Lighthouse Service with a view to securing more direct, simple, and economical methods of administration. The matter received consideration at the last session of Congress, which enacted legislation providing for the reorganization of the Lighthouse Service. This act was approved 17 June 1910, and became effective 1 July 1910. In pursuance of its provisions a commissioner and a deputy commissioner were appointed by the President and assumed duty on 1 July 1910. At the close of the fiscal year 1910 there were maintained under the Lighthouse Service, 1,692 lighted aids, including 68 light-vessels and excluding 2,344 post lights, and there were 8,046 unlighted aids. For the care and maintenance of these aids, exclusive of 1,984 of the post lights mentioned, there were employed 1,659 keepers, assistant keepers, and laborers attending lights paid from the appropriation "Salaries of Keepers of Lighthouses." The 1,984 post lights referred to were attended by 1,471 laborers, whose salaries were paid from the appropriation "Lighting of Rivers." There were also in the service 1,720 officers and seamen on board vessels, 330 regularly appointed employees for construction and repair, and 56 lighthouse tenders. By the act of 25 June 1910, congress authorized the employment of not to exceed 1,750 lighthouse and fog-signal keepers and laborers attending other lights for the fiscal year 1911, payable from the appropriation "Salaries of Keepers of Lighthouses," being an increase of 50 over the number authorized for the fiscal year 1910. On 30 June 1910, 1,659 keepers, assistant

keepers, and laborers attending lights were actually in the service.

Lightning and Death by Lightning. Many studies have been made, during the past year, of the general and special characteristics of lightning, but it still remains, to a certain extent, a mystery. No adequate explanation has yet been forthcoming of atmospheric electrification—though it has been thought that friction of air-currents, evaporation of moisture, the dashing of ocean waves on the rocky shores, etc., are all sources of at least a part of this charge. Lightning is generally divided into three heads for special study—zigzag, sheet, and ball-lightning. Some add 'bead'-lightning; though its existence is doubted by some. If it exists, it is probably a form of ball lightning, being a series of small balls, in some manner welded together. But whatever uncertainty attaches to the existence of ball lightning exists in a far greater degree of bead lightning.

It is now thought that sheet lightning differs from the zigzag variety only because of the fact that it cannot be seen, it is hidden from our direct gaze by the screen of clouds supervening between the flash and the eye of the beholder.

For years the existence of ball lightning was doubted, and it is yet, in certain quarters. Nevertheless, there are many well reported cases of its occurrence in late years. Further, the experiments of Prof. Righi, of Bologna, have shown that such flashes can be induced experimentally, so that all *a priori* doubt as to the occurrence of such flashes in nature should have been removed.

Recently, it has been ascertained that the lightning flash is composed of a number of smaller flashes, apparently instantaneous in time. It has been estimated that each of these flashes is about 1-30,000th of a second long.

The camera has done valuable service of late years,—partly in showing that lightning-strokes are usually composed of five or six discharges along the same path. Some are made up of as many as forty flashes. Experiments have also been made, in order to ascertain the voltage necessary for a lightning stroke. Lodge gave this as 5,000 million volts, for a flash a mile long. This seems extraordinarily high. Steinmetz estimated that the total energy of a flash of lightning was about 10,000 kilowatt-seconds.

As to atmospheric electricity, and auroral displays, it is now thought that these phenomena bear a distinct relation to sunspots, by which they are somehow affected. Prof. Elihu Thomson is of the opinion that the auroral streamers "often extend in a general direction outwardly from the earth, sometimes to very great distances relatively to the known extent of our atmosphere." Very little is known as to the causes of electricity in clouds.

When we come to the question of death by lightning, some real progress has of late been made. Such deaths are now usually attributed to what is known as *return shock*. Dr. John Knott, writing in the *New York Medical Journal*, says:

"Every substance capable of conducting the mysterious electric 'fluid,' on being placed in the vicinity of an electrified ('charged')"

body—and not connected to the same by a conducting medium—becomes charged with electricity of the opposite kind, and to approximately the same 'potential' or 'electromotive force.' In accordance with the physical necessity which determines this process, a man may stand within a moderate distance of a thunder cloud which holds an enormous charge of, let us say, positive electricity. In such position, his body necessarily becomes charged with *negative* electricity—by the influence of what is known as *induction*. While the state of equilibrium is maintained, without any abrupt disturbance, he feels no ill effect or inconvenience whatever. But when that cloud discharges its electricity in an opposite direction, the inductive influence instantaneously ceases; the induced negative charge is (in the same instant) neutralized by drawing an equal quantity of positive from the 'universal reservoir' of the earth. The shock corresponds in intensity to that producible by the discharge of the cloud itself, and passes through the nervous system with such effect that the individual drops dead—*instantaneously* and without a single trace of injury on or around his person."

In cases of direct contact with the passing lightning, burns, more or less expansive and penetrating, have been noticeable; but, as a rule, there is nothing very remarkable about them. One of the characteristics, indeed, of the post mortem conditions of death by lightning is that, when the shock has been direct and very powerful, the blood fails to coagulate after the normal fashion.

Lignite. Lignite is a soft, brown fuel which contains about 45 per cent of its weight in moisture. It is found extensively in both North and South Dakota and in Montana. During 1910 it underwent a series of tests at the reclamation service pumping plant at Williston, N. D., through which it was shown that lignite may be used with fair economy under boilers that generate their full rated capacity. The lignite is also found in the fields of the northwest, but that found there has a low heating value and it has been found difficult to burn it in the type of furnaces commonly used for the better grades of coal. However, the recent tests have shown the possibility of designing suitable furnaces for burning it profitably.

Lillis, Thomas F., R. C. bishop: b Lexington, Mo., 3 Mar 1862. He was graduated in arts from Niagara University, and studied theology at St. Benedicts College, Kansas, and in 1885 was ordained to the priesthood. He was pastor at Shackelford, Mo., 1885-86, and of St. Patrick's Church, Kansas City, Mo., 1887-94. On 27 Dec 1904, he was consecrated bishop of Leavenworth, Kan., as successor to the Rt. Rev. Louis Maria Fink, deceased.

Lincoln Memorials. A National memorial to Abraham Lincoln, to be erected in Washington at a cost of \$2,000,000, is proposed in a bill introduced on 13 Dec 1910, by Senator Cullom of Illinois. The bill named a permanent commission, to be composed of President Taft, Senators Wetmore, of Rhode Island, and Money, of Mississippi, and Representatives McCall, of Massachusetts and Champ Clark, of Missouri. The sum of \$100,000 was to be available under the bill.

Mr. and Mrs. Charles P. Taft volunteered also in Dec. 1910 to give \$100,000 to the City of Cincinnati for a monument to Abraham Lincoln. This put an end to a dispute that had arisen around another gift. Three years before, the people of Cincinnati thought they would like to have a statue of the martyred president. Some subscriptions were started, but little money was raised, and the matter was dropped till the death of Frederick Alms, a rich hotel man, who, in his will, left his widow \$100,000 to erect the monument provided it was known as the Alms Lincoln Memorial. When the question of choosing a sculptor came up, a committee of five trustees was formed and they chose George Gray Barnard as sculptor. Mrs. Alms later tried to withdraw the commission from Barnard and give it to Gatzon Borglum, the New York sculptor. When the matter threatened to engage the courts Mr. and Mrs. Taft declared they would erect the monument themselves and gave the contract to Mr. Barnard, who will do the work in Paris within two years.

Gatzon Borglum also finished, towards the close of 1910, the model of the Lincoln statue, which is one of the three monuments presented to the City of Newark, N. J., by the Amos H. Van Horn estate. The model will be cast in bronze and erected on Lincoln's birthday, 12 February, in the triangle in front of the new court house, Newark. The sculptor has depicted Lincoln sitting at the extreme end of a park bench with his hat beside him, in a slightly stooped position, apparently at rest. The figure is one and one-half times life-size, and if standing, would be nine feet six inches high. The figure and the bench will be cast in one piece of bronze, and will be, it is said, the largest single piece of sculpture ever cast in this country.

Liquid Air and Oxygen. Liquid air is now used very largely in the physical laboratory for inducing low degrees of cold, and for various special experiments. It is also being used to some extent in industrial purposes; also the oxygen obtained from liquid air (liquid oxygen) is finding extensive use in various directions. Mr. George Claude, in a recent paper read before the Society of Civil Engineers in France, said:

"Commercial plants for the production of liquid air by the Claude process, or by the Linde process exist in various European countries. . . . Their chief product is compressed oxygen, and the principal applications of the oxygen are autogenous welding with the oxy-acetylene flame, cutting of metals with the oxy-oxy-acetylene flame, and the manufacture of artificial precious stones.

"At present one cubic meter (35.3 cubic feet) of oxygen is obtained per horsepower-hour in apparatus containing 50 cubic meters (1,765 cubic feet) per hour. The figure 1.25 cubic meters (44 cubic feet) of oxygen per horsepower-hour is guaranteed for apparatus producing 200 cubic meters per hour."

The consumption of liquid oxygen is much greater than is generally supposed, although we have no accurate statistics regarding it. Three methods of manufacture are in use. By the Brin method, barium oxide (BaO) is heated in a current of atmospheric air to form barium peroxide (BaO₂). The air current is

then stopped, and the barium peroxide reheated in a partial vacuum, whereby oxygen is given off. By the second, the electrolytic method, the gas is obtained from water, but this is economical only when there is use at the same time for the hydrogen generated simultaneously with the oxygen in equivalent proportion. Electrolytic cells for this purpose have been devised by Schuckert, Garuti, Schmidt, and others. The third method, based on the fractional distillation of liquid air, is now very largely employed in Europe. For operation on a large scale, the cascade principle, which was first used by Pichet in 1877, is used to advantage. The oldest use found for oxygen is in explosives,—oxygen cartridges not being dangerous. In recent years oxygen has found use in the production of light. Oxygen is also used in the production of fused quartz (silica) vessels. Oxygen used in medicine must have the highest purity, this accounts for the higher price. According to Michælis, oxygen, which is 96 to 97 per cent pure, costs only about three-fifths as much as oxygen 99 per cent pure. It is doubtful, however, if this high standard is maintained in America,—the above figures applying to the German market.

Liquor Legislation. See TEMPERANCE LEGISLATION

Liquors, Production, and Consumption. *Production.*—The Messrs. Gilbey's (London) report of wine production for 1910 showed the most disastrous conditions that have existed in Europe since 1810. Humidity in the early spring and summer engendered insect life that destroyed the grape vines. In Germany along the Rhine and Moselle, there was barely one-tenth of an average crop. In the Champagne and Saumur districts and in the Burgundy and Chablis districts of France the vintage was positively a blank. In Cognac no brandy was distilled in 1910. In the Medoc and other districts of Bordeaux, more favored than any other part of France, there was little more than one-third of the average quantities of claret and Sauterne made.

In Austria-Hungary the crop was estimated at one-third. In Sicily there was about two-thirds of an average from the old vines, but the young vines, planted since the invasion of phylloxera, produced well, so that the island's total crop was as in 1909. In Northern Spain, and also in the south and sherry districts, there was from half up to three-quarters of a crop.

The Portuguese yield was nearly average and the quality was good. Thousands of tons of grapes were sent from Lisbon to France and Germany, whose idle presses thus were occupied and the duty on imported wines avoided.

In Italy, according to official reports, the vines gave about 54,000,000 quintals of grapes in 1910, as against 98,000,000 in 1909. Even this estimate is generally considered too high. The phylloxera is reported in several fresh districts, and the general loss both from that cause and weather conditions was heavy.

The normal annual yield of the European vineyards is computed at 3,000,000,000 gallons. Of this France usually produces about 1,000,000,000 gallons. In 1910, France's production was only 400,000,000 gallons. As France is both the largest producer and consumer of wine the failure of that year's harvest was nothing

less than a national disaster. Assessing the wine at a price of only 16 cents a gallon, the loss to France in 1910 was about \$100,000,000.

Official figures show that in April 1910, 168,000,000 bottles were in the cellars of Reims and Epernay, apart altogether from stocks in the hands of merchants in other parts of France and the rest of the world. This represents the world's consumption of champagne for at least four years. In the ordinary course, 40,000,000 to 45,000,000 of bottles would have been added to the stock. As it is, there was not a single cask bottled for champagne in 1910. Little of the celebrated vintage of 1898 remains. The excellent champagne of 1900 is the one now being chiefly consumed in England. The vintage of 1904, which has been the principal champagne shipped from France during the last two years, is much appreciated for its lightness and elegance. The coming vintage of excellence is that of 1906, to be shipped to England next year. It already has a high reputation in the trade. The next champagne year was 1907. This wine is now generally admitted to be much finer than was originally anticipated.

A consoling report as to the champagne reserve was also made by the Marquis de Polignac, the secretary general of the champagne wine trade syndicate, who stated that the stock on hand amounted to 160,000,000 bottles, and that, as the average rate of consumption during the preceding decade was 32,220,000 bottles annually, there would be plenty to spare. Moreover, the owners of vineyards have been energetic in preserving the wood and leaves of their vines in anticipating the crop for 1911. The disaster of 1910 was felt with special severity by the growers, as the two previous vintages had been considerably below the average. Property in champagne is immensely parcelled out, since as many as 20,000 growers have 16,000 hectares of vines between them, and as the maintenance of a single hectare costs about \$600, and many of these proprietors had already been compelled to borrow money, their position in 1910 was the reverse of enviable.

With regard to clarets, the famous vintages of 1899 and 1900 are becoming very scarce. Three later vintages are of acknowledged merit—1905, 1907, and 1909. The 1909 clarets have been the surprise of the century. Owing to the bad summer they were not made till late in October, but they unexpectedly developed such extraordinarily good qualities that the whole of the classified growths and most of the premier bourgeois wines of Medoc were bought up by the Bordeaux merchants within a month at comparatively high prices, and the whole of the 1908 vintage was left in the hands of the growers.

With regard to port, whatever may be the merits of the vintages of 1909 and 1910, which are both considered useful wines, there is an accumulation of old wines, particularly of those still in wood, out of all proportion to the consumption. There have been several good port years since the famous vintages of 1878 and 1887, notably 1890 and 1896. But there has been no year that has so appealed to connoisseurs as 1908. The samples of this vintage were only shown a few months ago, and nearly the whole of the stock in the hands of the shippers was sold by Nov. 1910, to English

wine merchants, and the greater part shipped. There is a consensus that 1908 will rank as one of the finest port vintages.

Outside Europe, vineyard crops for 1910 were fairly good. Madeira's vintage was nearly average and of good quality. Algeria had an excellent vintage both in quantity and quality, while the wines have doubled and in some instances trebled in value. Fifty years ago Algeria produced no wine. Now the output is nearly 200,000,000 gallons annually. Nearly all this is consumed in France, where it is in greater request and more highly appreciated than many of the cheaper home productions.

Consumption—The following figures show the annual per capita consumption of liquor in the United States: 1860, 6.43 gallons; 1870, 7.70 gallons; 1880, 10.08 gallons; 1890, 15.53 gallons; 1900, 17.69 gallons; 1909, 21.85 gallons.

The consumption of spirits has dwindled during these years from 2.86 to 1.35 gallons per capita, while that of wine had doubled from .35 to .70 gallon, and of malt liquor has increased sixfold from .322 to 1.979 gallons. That is, lighter beverages have become the favorite in the United States.

For the year ending 30 June 1910, the United States consumed more spirits and liquors than in any other year. This caused surprise in view of the gains made in the cause of prohibition throughout the Southern States, and the increasing favor given to local option in the West, East, and North. The consumption, as compiled by the Internal Revenue Bureau at Washington, is as follows: 163,000,000 gallons of distilled spirits, 30,000,000 more than the year before, and 59,485,117 barrels of fermented liquors, an increase of 3,000,000 barrels. Commissioner Cabell's report, speaking of illicit distilling, says Alabama, Georgia, North Carolina, and South Carolina lead in offenses of that character. In the year up to June 1910, officers closed 1,911 such plants, 200 more than the year before. The commissioner states that manufacture of "moonshine" whiskey is on the increase especially where there are State-wide prohibition laws. During the fiscal year ending June 1910, the internal revenue on distilled spirits was \$141,523,554, and on fermented liquors \$59,485,116.

In Great Britain, the per capita consumption of malt liquor has steadily fallen between 1900 and 1910 from 31.48 to 25.87 gallons, and of spirits from 1.10 gallons to 0.58 gallon, or decreases 10 per cent and 43 per cent. During 1909-10 the consumption of beer was 412,100 barrels less than in the previous year—a decline of approximately $1\frac{1}{4}$ per cent for every 50 glasses of beer drunk by John Bull in 1900-01 he consumed only 41 last year. The annual drop in the consumption of spirits is much more remarkable, amounting, in 1909-10 to as much as 33.1-3 per cent—one glass out of every three. In 10 years the quantity of spirits drunk in England has fallen from 45,402,500 to 26,006,200 gallons, a decline of 43 per cent; while the consumption per head has fallen over 47 per cent—one glass of spirits in 1909-10 approximately taking the place of two in 1900-01.

The "no drink between meals" movement, started by the London *Daily Mail* eight years

ago, continues to grow. Figures showing the remarkable progress made by semi-teetotalism in England give the membership of the association as 200,000 in 1908. That has now increased to 350,000, of whom 75,000 had been enrolled in the year ended 31 March 1910. A noteworthy feature of the movement is that it is making total abstainers. Many of the pledges issued have been returned with the words "except at my midday and evening meals" struck out, the signatories thereby becoming total abstainers.

Literature, 1910. The book production of the United States for 1910 passed all records, exceeding even the high water mark of 1909, and placing us close to the head of the book-producing countries of the world. Though there have been few books of preeminent merit, making the task of selection doubly difficult, the level of excellence has been more than fair. In fiction there is scarcely a name of first rank, Meredith and Kipling being represented only in a fragmentary way. Roosevelt's 'African Game Trails' and Peary's 'The North Pole' overshadowed all other works of their kind. The former stimulated the production of many other books on Africa. The biography of the year was large in amount, the most important contribution being John Bigelow's 'Retrospections of a Long Life.' Pure literature and meritorious poetry made but a poor showing. Sociology and economics are still increasing, while religion and philosophy are declining both in popularity and production. Aviation has become a factor in literature during the past year. Other books whose sales made have been somewhat less but whose authors have become standard producers of high-grade fiction chief among which may be numbered

'An Affair of Dishonor,' by William De Morgan; 'Tower of Ivory,' by Gertrude Atherton; 'A Modern Chronicle,' by Winston Churchill; 'Cavanaugh, Forest Ranger,' by Hamlin Garland; 'Strictly Business,' and 'Whirligigs,' (collections of short stories), by O. Henry; 'The Second String,' by Anthony Hope; 'The Finer Grain,' by Henry James; 'Little Aliens,' by Myra Kelly; 'The Wild Olive,' by Basil King; 'The Girl from Marshcroft,' by Selma Lagerlof; 'Celt and Saxon,' by George Meredith; 'The Thief of Virtue,' by Eden Philpotts; 'Rewards and Fairies,' by Rudyard Kipling; 'Jean Christophe, Dawn—Morning—Youth—Revolt,' by Romain Rollan; 'Whirlpools,' by Henry Sienkiewicz; 'Lady Merton Colonist,' by Mrs. Humphrey Ward; 'The New Machiavelli,' by H. G. Wells; 'The Rules of the Game,' by Stewart Edward White; 'Rest Harrow,' by Maurice Hewlett, and 'The Rosary,' by Florence Barclay.

The "Best Selling" Fiction easily showed an increase of sales over that of former years. The principal works of this class of fiction were as follows: 'Thurston of Orchard Valley,' by Harold Bindloss; 'The Personal Conduct of Belinda,' by Eleanor Hoyt Brainerd; 'Ailsa Paige,' by the Robert W. Chambers; 'Young Wallingford,' by George Randolph Chester; 'Routledge Rides Alone,' by Will Levington Comfort; 'The Red House on Rowan Street,' by Roman Doubleday; 'Queen Sheba's Ring,' by H. Rider Haggard; 'The Taming of Red Butte Western,' by Francis Lynde; 'The Rose in the Ring,' by George Barr McCutcheon;

'The Voice in the Rice,' by Gouverneur Morris; 'The Siege of the Seven Sutors,' by Meredith Nicholson; 'The Running Fight,' by William Hamilton Osborne; 'The Husband's Story,' and 'White Magic,' by David Graham Phillips; 'The Window at the White Cot,' by Mary Roberts Rhinehart; 'The Kingdom of Slender Swords,' by Hallie Erminie Rives; 'The House of the Whispering Pines,' by Anna Katherine Green; 'No Man's Land,' by Louis Joseph Vance; 'The Motor Maid,' and 'Lord Loveland Discovers America,' by the Williamsons; 'A Splendid Hazard,' by Harold MacGrath, and 'The Illustrious Prince,' by E. Phillips Oppenheim

'The Rod of Justice,' by Leake and Askew; 'The Biography of a Boy,' by Josephine Daskan Bacon; 'The Achievements of Luther Trant,' by Balmer and McHarg; 'The Mistress of Shenstone,' by Florence L. Barclay; 'The Doctor's Lass,' by Edward C. Booth; 'Clever Betsey,' by Clara Nyasaland; 'The Varmint,' by Owen Johnson; 'The Singing Mouse,' by Emerson Hough; 'The Creators,' by May Sinclair; 'His Hour,' by Elynor Glyn; 'The Unforeseen,' by Mary Stewart Cutting; 'Once Upon a Time,' by Richard Harding Davis; 'Just Horses,' by Sewall Ford; 'Potash and Perlmutter,' by Montague Glass; 'Mr. Carteret and Others,' by Davis Gray; 'The Right Stuff,' by Ian Hay; 'A Life for a Life,' by Robert Herrick; 'Simon the Jester,' by W. J. Locke; 'The Wild Oats,' by James Oppenheim; 'Danbury Rodd, Aviator,' by Frederick Palmer; 'The Fighter,' by Albert Payson Terhune; 'The Eagle's Feather,' by Emily Post; 'By Inheritance,' by Octave Thanet; 'George Meek, Bath Chairman,' by Himself; 'The Pools of Silence,' by H. D. Stacpoole; 'Burning Daylight,' by Jack London; 'Spread Eagle,' by Gouverneur Morris; 'Mr. Ingleside,' by J. V. Lucas; and 'Clayhanger,' by Arnold Bennett

The most important works under classified headings are briefly as follows.

Biography.—'Edison, His Life and Inventions,' by Dyer and Martin; 'Bishop Potter, the People's Friend,' by Harriette A. Keyser; 'The Japanese Letters of Lafcadio Hearn,' by Elizabeth Bisland; 'Grover Cleveland—a Record of Friendship,' by Richard Watson Gilder; 'Daniel Boone and the Wilderness Road,' by H. Addington Bruce; 'Marion Harland's Autobiography,' by Life and Art of Richard Mansfield, by William Winter; 'Intimate Life of Alexander Hamilton,' by Dr. A. M. Hamilton; 'T. R. in Cartoons,' by John T. McCutcheon; 'The Corsican; a Diary of Napoleon's Life in His Own Words,' compiled by R. M. Johnston; 'Life of Tolstoi,' by Aymler Maude; 'Napoleon in His Own Defense,' by Clem K. Shorter; 'The Real Francis Joseph,' by Henri De Weindel; 'Jane Austen and Her Country House Comedy,' by William H. Helm; 'Porfirio Diaz, President of Mexico,' by Jose F. Gadoy; 'George Sands, Some Aspects,' by Rene Doumic; 'The Empress Eugénie, 1870-1910,' by Edward Logge; 'The Right Honorable Cécil John Rhodes,' by Sir Thomas F. Fuller; and 'Famous Impostors,' by Bram Stoker.

History.—'The History of the Confederate War,' by George Cary Eggleston; 'The Buccaneers of America,' by J. Esquemeling; 'The American Civil War,' by John Formby; 'The

Indian and His Problem,' by F. E. Leupp; 'The Campaign of Trafalgar,' by Julius S. Corbett; 'A Century of Empire, 1801-1900,' by Sir H. E. Maxwell; 'Fifty Years of New Japan,' compiled by Count Shingenobu Okuma, and 'The Rise of South Africa,' by G. E. Cory

Sociology and Political Economy.—'Land and Labor; Lessons from Belgium,' by B. S. Rountree; 'Socialism and Superior Brains,' by George Bernard Shaw; 'The Spirit of America,' by Dr. Henry Van Dyke; 'The Old Order Changeth,' by William Allen White; 'Administrative Problems of British India,' by Joseph Chailey; 'Ancient and Modern Imperialism,' by Lord Cromer; 'Strikes,' by O. G. Crosby; 'Adventures in Socialism,' by Alexander Cullen; 'The Future of Trade Unionism,' by Charles W. Eliot; 'Police Administration,' by L. F. Fuld; 'Labor in Europe and America,' by Samuel Gompers; 'Types from City Streets,' by Hutchins Hapgood; 'Highways of Progress,' by James J. Hill; 'Conditions of Progress in Democratic Government,' by Chales E. Hughes; 'The Beast,' by Judge Benjamin B. Lindsay; 'The Fight for Conservation,' by Gifford Pinchot; 'Through Afro-America,' by William Archer; 'The Suffragette,' by E. S. Pankhurst; 'What Eight Million Women Want,' by Rheta C. Door; 'Criminal Psychology,' by Hans Gross; 'Why American Marriages Fail, and Other Papers,' by Mrs. A. A. Rogers

Poetry and Drama.—'The Enchanted Island and Other Poems,' by Alfred Noyes; 'Chantecler,' by Edmond Rostand; 'Cowboy Songs,' by John A. Lomax; 'Mary Magdalene—a Play,' by Maurice Maeterlinck; 'A Study of the Drama,' by Brander Matthews; 'The Theory of the Theatre and other Principles of Dramatic Criticism,' by C. M. Hamilton; and 'At the New Theatre and Others,' essays by Walter Pritchard Eaton.

Essays.—'The New Word' by Allen Upward; 'Revolution and other Essays,' by Jack London; 'The Lost Art of Conversation,' compiled by Horace S. Krans; 'Speeches and New Letters of Henrik Ibsen,' compiled by Arne Kildel; 'Mr. Dooley Says,' F. P. Dunne; 'Mark Twain's Speeches,' 'What's Wrong With the World,' by G. K. Chesterton; 'Landmarks in Russian Literature,' by Maurice Beerling; and 'The River and I,' by John G. Neihardt.

Philosophy.—'Knowledge, Life, and Reality,' by George T. Ladd; 'Christianity and the New Idealism,' by Rudolf Eucken; 'The Influence of Darwin on Philosophy, and other Essays,' by John Dewey; and 'American Problems from the Point of View of a Psychologist,' by Hugo Munsterberg.

Religion.—'Seeking after God,' by Lyman Abbott; 'The Spiritual Unrest,' by Ray S. Baker; 'The Durable Satisfaction of Life,' by Charles W. Eliot; 'History of Ethics Within Organized Christianity,' by Thomas Cuthbert Hall; 'The Mask of Christian Science,' by F. E. Marsten; and 'Christianity and the Modern Mind,' by Samuel McComb

Education.—'The Education of Women,' by Marion Talbot; 'Education in the United States,' by Nicholas Murray Butler; and 'Open Air Schools,' by L. P. Ayers.

Besides the many standard works quoted

there may be mentioned others of miscellaneous character: 'Across the Sahara from Tripoli to Borny,' by Hanns Vischer; 'With Mulai Hafid at Fez,' by Lawrence Harris; 'The Holy Land,' by Robert Hichens; 'Rare Days in Japan,' by Dr. George T. Ladd; 'Peaks and Glaciers of Nun Kun,' by Mrs. F. B. Workman; 'Jungle By-ways in India,' by E. P. Stebbing; 'Sport and Travel in the Far East,' by Joseph C. Grew; 'A Woman's Impressions of the Philippines,' by Mary H. Fee; 'China as I Saw It,' by A. S. Roe; 'China, Its Marvel and Mystery,' by T. H. Liddell; 'The Great Wall of China,' by William E. Geil; 'The Russian Road to China,' by L. W. Bates; 'Changing China,' by Lord and Lady Cecil; 'A Vagabond Journey Around the World,' by Harry A. Franck; 'The New Baedeker,' by Harry Thurston Peck; 'Hunting with the Eskimaux,' by Harry Whitney; 'Beyond the Mexican Sierras,' by Dillon Wallace; 'Channel Islands of California,' by Charles F. Holder; 'Confessions of a Barbarian,' by George Sylvester Viereck; 'African Game Trails,' by Theodore Roosevelt; 'The North Pole,' by Commander Peary; 'Egypt,' by Pierre Loti; 'Landscape and Figure Composition,' by Sadakichi Hartman, and 'A Japanese Artist in London,' by Yoshio Markino.

Lithography. Sir Herbert von Herkomer, the Royal Academician, who for the last quarter of a century has been in the public eye not only as an artist, but also as the inventor of many art appliances, and the leader of a successful school, gained widespread attention during the year 1910 by announcing the discovery of a new process of lithography. This is practically a reversion of the style now employed. At present a kind of stone when drawn upon by the greasy ink pencil, bitten with acid, and then wetted, possesses the property of accepting printing ink upon the drawn parts and rejecting it upon the wetted ones. Therefore, if the stone upon which the design has been drawn is inked and printed the facsimile of the drawing is printed off, so that each "proof" or print of it is as much an "original" or autographic design as an etching printed from a copper plate. According to the new method introduced by Herkomer, however, the stone is ground to a very fine surface and then covered with greasy ink by dabbing it in. On this surface the design is then sketched with a lead pencil and the background is gone over with a silver hat pin or a shading pen. When the etching on the stone is completed, a proof is taken which, although the last stage in the old process, is really the first in the new. Sir Hubert then dechemicalizes his stone and begins again, adding work to obtain all the effect or further modelling he wishes. The process of taking proofs then continues until the artist is satisfied. This new method is said to possess amazing force and produce magnificent, velvety blacks.

Living, Cost of. The cost of living, a phrase which has become a catchword within the last five years, owes its familiarity to the phenomenal increase in the price of many commodities of daily use, and the gradual increase in the cost of others. It may be said broadly that none of the necessities of life is now lower in price than it was in 1905, the apparent cheapness of a few commodities being balanced

by a lessening of real value. This increase varies according to the situation of any given community, being greatest in the large cities, and least in rural regions where home industries like the raising of vegetables and grain tend to keep prices down by competition. It is not confined to this country. Prices in Buenos Aires are higher than they are in New York, and the prices of many groceries are higher in England than here. The advance in the cost of living has not, it is generally admitted, been accompanied by a corresponding increase in the income of the average man, and the economic disturbance thus produced has been explained by attributing it to some one of a variety of causes, all of which probably combine to produce the result.

Rents, the most sensitive of factors in the cost of living, have increased from 10 to 25 per cent in most cities. Twenty years ago, in the City of Washington, \$25 or less a month was the rent of a six-room house suitable for a family with an income of \$1,500 a year; to-day the same house rents for \$30, and a four-room apartment for from \$30 to \$50, not counting apartments in fashionable neighborhoods. In New York it is not uncommon for an apartment in a fairly good neighborhood above Central Park to rent for \$35 one season and \$40 the next—an increase of 14 per cent, which, though it is not repeated every year, has the effect of driving the \$35 a month renter further and further out of town. Generally speaking, increase in rent is proportionate to increase in population, and the demand for houses or apartments of moderate cost. A minor factor is a general increase in the strictness of building laws, which operates to tear down old houses and put up new buildings with modern improvements at a somewhat increased cost. See TENEMENTS.

The rental of offices, shops, and stores, responds even more quickly to any general upward movement in prices, and this increase in expense the tradesman necessarily meets by an increase in the prices of his commodities. Moreover, the demand for food in sealed packages, created by a widespread feeling in favor of sanitary food, operates to increase the general price of such commodities, by reducing the trade of local bakers, butchers, and truckmen. Their supply might compete with the wholesalers, but it cannot compete with the manufacturers of biscuits and cookies put up in sealed cartons, the wholesale dealers in preserves and canned foods who have their own large farms, and the stockyard men who sell a half-pound can of the best boned chicken for 30 cents, a whole ox tongue for 90 cents, and a pound of cooked ham for 28 cents. The production of such foods in quantities which dominate their market, while they can be purchased and kept in stock in the house, has changed the whole character of the grocery trade in many localities. Yet these high-class groceries themselves show traces of the advance. Potted chicken which five years ago sold at 25 cents a can has risen to 28 cents and then to 30; quarter-pound cans of potted ham have risen from 10 to 11 cents; canned mushrooms which were 25 cents are now 30; currants have risen from 12 to 14 cents. These are prices of high-class standard groceries, in cans or packages.

LIVING

Eggs, butter, and milk have been among the commodities most seriously affected. Five years ago eggs at 40 cents a dozen were considered costly; now it is not uncommon for them to reach 50 and even 60 cents a dozen, while even eggs of inferior quality are not to be had at a much lower price, the reduction in money being made up for, as a rule, by the number of spoiled eggs in the dozen. Here is an instance that the United States does not suffer alone in the matter of high prices, for eggs sell in the Argentine Republic for 80 cents a dozen. On the other hand, in a country village in Maine, 15 miles from the railroad, eggs are considered to have reached a high price at 28 cents. Butter has gone up in less than ten years from 33 to 40 and 45 cents a pound for the best. Milk has risen from 8 to 10 and 12 cents a quart for good milk, while in many neighborhoods the dealers will not sell less than a sealed pint bottle. Strictness in enforcing dairy laws has driven many small dairy farmers out of business, diminished competition, and improved the quality of milk, while regulations as to cleanliness of bottles and cans has added the cost of the extra labor to the price of milk.

The increased facilities in transportation which enable farmers and fruit-growers to reach city markets have affected the cost of living in small towns. Off the railroad, local market-gardeners will, in the height of the season, sell strawberries at 10 or even 8 cents a box, but in no place within reach of a city market in the North can they be had for less than 2½ cents at any time, while the usual price is 15 or 20 cents for good berries. The same holds true of vegetables and fruits of all kinds, and this naturally affects the summer population in the country and the expenses of the factory-worker in the small town. Moreover, private vegetable gardens and chicken-yards are far less common than they were a generation ago, owing to three causes: (1) The general movement of the population into cities and towns where land is costly, (2) the tendency of women to go into shops and factories, reducing the available supply of home labor, and (3) the truant laws which keep all children in school during the school year, so that their labor cannot be utilized for home industries to any great extent. In addition to this, there is a far greater variety of food than ever before, including oranges, bananas, and cooked food of all kinds at all seasons, and this, by decreasing the demand for fresh meat, vegetables, and fruits of staple home-grown varieties, decreases competition and throws the whole trade into the hands of large dealers who sell through several middlemen. In short, it may be said that so far as the food supply is concerned, every tendency in civilized life in the past decade has been such as would raise the price of food rather than lower it.

Still another factor in the cost of living is the storage facility which exists for the keeping of perishable foods, and this has been immensely improved year by year. Instead of being obliged to sell off perishable stock at once, at any price, the butcher, the grocer, the fruiterer, and the dairyman can keep prices comparatively stable. It has been charged that in the transportation of perishable fruits and meats in refrigerator cars the railroads have

invariably charged "all that the traffic will bear," and that this unjust price has added to the burdens of the consumer. It is certain that oranges which cost 50 cents a dozen five years ago now cost an even five cents apiece, and that peaches, once to be had as low as ten cents a dozen, and even sold by the bushel, now cost, at the lowest, 20 cents a dozen.

As for meat, the local butcher has practically gone out of existence in the small town, and where he does persist he must buy, not from the local farmer, but from the wholesale dealer in a city where butchering is carried on by gigantic methods, and from which he gets the carcass in refrigerating cars. The delicatessen shop must not be forgotten in any discussion of the cost of food. Most of these places will sell a slice of meat, an individual portion of salad, or any part of a roast chicken, for a small sum, and this helps to reduce the numbers of housekeepers who buy a roast or steak every day.

A city market with some of the features of a delicatessen will advertise at certain periods chickens, lamb, beef, etc., at special prices, and "cooked to order free of charge."

With such shops as this the butcher must compete, and while, naturally, to buy meat from such dealers is not as cheap, generally, as to buy from the butcher and cook it at home, it should not be forgotten that time is thus saved; and the woman who can use her time to financial advantage can buy her dinner ready cooked and actually save in the year's cost of living. This is particularly true of bread. Home-made bread practically does not exist in any city. The five-cent loaf costs no more, in view of the increase in the cost of flour and fuel, than a loaf of the same size made at home. In the case of cake, the baker scores a point again. One can buy a cake for twenty cents, or a dozen small cakes for fifteen, while the materials needed to make either at home would cost as much if not more. The baker's cake is, in fact, as cheap as breadstuff of certain kinds; he sells rolls for 12 cents a dozen and small cakes of about the same size for a cent each. Most bakers now charge 10 cents for a loaf of "Boston" brown bread, and they charge no more for a loaf of cake of the same size.

In the matter of clothing the most striking increase in the cost of living comes under the head of wool. Miss Ida Tarbell makes the statement that wool has reached a price at which no one but the few can afford it. She states that a child's knitted shirt, sold at 50 cents for wool, and well made, proved under chemical analysis to have not a trace of wool in it. The same was true of a girl's sleeveless jacket, sold at \$1.25 in an East Side shop in New York as wool. Nicholas Longworth, M.C., cited before the committee on Ways and Means a statement of a clothier to this effect. "I never handled cloth of so inferior a quality as I do now." Miss Tarbell makes the statement that the man or woman who buys a suit at \$10 or \$12 buys cotton worsted or cheap shoddy, not wool, and that a member of the Nurses' Settlement found, among 400 families whom she visited, only one pair of woolen blankets. The increasing abundance of well-made, cheap, ready-made clothing, by displacing home-made suits and

dressess and underwear, even for children, is an important factor in the cost of living. It is now possible to buy all sorts of children's and infants' wear for from 50 cents down to 10 cents. Cotton hose may be had for 12½ cents, which five years ago could hardly be had for less than double that price, silk gloves are sold for 38 cents a pair, women's shirt-waists of fair quality and style cost only \$1 apiece. Such prices as these were not possible ten years ago.

The average yearly earnings of the employees of the United States Steel Trust are less than \$800 a year apiece. In 1907 the mule spinners in the Massachusetts woolen factories averaged \$13.16 a week. The average weekly wage of the factory girl in New York ranges from \$9 to \$5, with long hours. It does not take much calculation to see that a jump in the cost of living which raises all the necessities of life from 10 to 25 per cent must create a serious problem.

With the beginning of 1911 there was noticed a lowering in the price of many food-stuffs, particularly meats. The packers say that this is due to their being able to obtain the meats cheaper from the farms. The figures are definite. On 20 June 1910, the packers paid \$8.85 per hundred pounds for beef cattle, the retailers paid 9 to 14 cents per pound for ribs, 10 to 16½ for loins, 8½ to 11½ for rounds, 7½ to 9½ for chucks, and 7 to 8 cents for plates, the price paid by consumers was 20 cents a pound for sirloin steaks, 25 for porterhouse, 20 for club steaks, 18 cents for round, 12 cents for pot roast, and 18 cents for rib roast. Prices at restaurants rose about that time.

On 18 Nov. 1910, the packers were paying \$1.60 less per hundred pounds for beef cattle, and the prices to retailers were 7 to 13 cents per pound for ribs, 8½ to 18 for loins, 7 to 10 for rounds, 6 to 8 for chucks, and 5½ to 7½ for plates. The consumer paid for sirloin steaks 18 cents a pound, for porterhouse 22, club steaks 18, 17 for round, 10 for pot roast, and 16 for rib roast.

In mutton and lamb the cost to the packer has been reduced \$4.60 to \$5.55 per hundred pounds, the cost to the retailer 4¼ to 5¾ cents a pound, and the consumer's price has fallen from 5 to 7 cents a pound. The price of pork, to the packers, dropped 37 cents a pound, and the price to the consumer was lowered from 1 to 5 cents a pound. It is to be noted in this connection that pork in its various forms is a workingman's dish, and doubtless was substituted for the higher priced meats to a considerable extent. When beefsteak reached a prohibitive price the demand for it fell off and the price dropped accordingly. The packers say that the remedy for high prices is to be found on the farm, and that it would be easy for the farmer to put a couple of pounds more on each animal, by scientific feeding, and to raise stock more extensively.

Other decreases in price during 1910 were wheat, which declined 23.1 per cent between May and October; oats, which declined 33.4 per cent; spring wheat flour, 19.4 per cent; and glucose, 34.4 per cent. Tea dropped from 24 to 21 cents wholesale, and rice half a cent. Kerosene in cases dropped 1 cent a gallon.

Lloyd, Arthur Seldon. P. E. bishop coadjutor of Virginia and 244th in succession in the American episcopate: b Mount Ida, Alexandria County, Virginia, 2 May 1857. He was prepared for college at the Potomac Academy, Alexandria, Va., was an undergraduate at the University of Virginia, 1874-77, and was graduated at the Theological Seminary of Virginia, B.D. in 1880, and he received his D.D. from Roanoke College, in 1898. He was admitted to the diaconate in 1880, and advanced to the priesthood in 1881. He was a missionary in the mountain region of Virginia, 1880-85, where he learned the wants of the mountaineer families living remote from church privileges and which was the first incentive toward devoting his life to the mission work of the church. He served for four years as rector of St. Luke's Church, Norfolk, Va., and in 1889 accepted the secretaryship of the Domestic and Foreign Missionary Society, and in that capacity, and as its president after 1910, he became widely known in every part of the world in which the American Church has a foothold. He declined elections as bishop of Mississippi in 1903, of Kentucky in 1904, as coadjutor bishop of Southern Virginia in 1905, and as coadjutor bishop of Maryland in 1908. Upon his fifth election as bishop he was made coadjutor bishop of Virginia, and this call he felt bound to obey as it came from his birthplace, and loyalty to Virginia for the time prevailed, and he was consecrated 20 Oct. 1909, in Christ Church, Alexandria, by the presiding bishop assisted by the bishops of Virginia and Southern Virginia as co-consecrators. He was prevailed upon at the time of the General Convention of 1910 to accept the presidency of the Board of Missions, in which he had already labored for 21 years, as secretary and nominal executive. His work as the head mission officer gives to him a prestige never before enjoyed in the Protestant Episcopal Church, and illustrates the progress that has been mapped out and carried forward by him, in the transformation of the church's attitude toward missions.

Lloyd-George, David. English statesman: b. Manchester, Eng., in 1863, son of William George, who was master of Hope Street Unitarian Schools, Liverpool, Eng. He was educated privately and at Llanystymdwy Church School, studied law and engaged in practice as a solicitor in 1884. He was president of the board of trade, 1905-08, and was elected Chancellor of the Exchequer, in 1908. The honorary degree of D.C.L. was conferred on him by Oxford University. During the political campaign in England, in 1910, he ridiculed the cry of American dollar dictation, which was one of the principal features of the campaign, he holding that "many noble houses of tottering foundations had been restored by American dollars, and that in 20 years, \$80,000,000 had been paid by the American children of Irish peasants in back rents to aristocratic Irish landlords." In this he was bitterly opposed by the Duke of Marlborough. He also attacked the social class, known as the idle rich, and in Nov. 1910, he was spoken of as the possible successor to Mr. Asquith as prime minister.

Loans and Trust Companies. See BANKING

LOBSTER FISHERIES—LOCOMOTIVES

Lobster Fisheries. In resolutions that were passed at a meeting of members of the commissions representing Rhode Island and Connecticut, held at Newport, in Dec. 1910, the adoption of uniform laws for the protection of lobster fisheries along the entire New England coast was advocated. The meeting was the first of a series looking toward the conservation of the fisheries of New England. There were 19,936,542 pounds of lobster caught in Maine during 1910, valued at \$2,145,204. This is a record catch for the State, verifying the statement often made by Commissioner Donohue, of the Sea and Shore Fisheries, that if the fishermen could liberate the small lobsters and allow them to grow to market size, with the present method of propagating lobsters the catch must necessarily largely increase. A total of 120,900,000 lobster fry was planted in the State during 1910.

The laws of the New England States are intended to insure a steady supply of lobsters. But legislation and lobster culture appear to have no effect on retail prices. The lobster is a product of the sea, it costs nothing to raise a crop, and the work of catching is neither difficult nor hazardous. Yet the lobster is about the highest priced food in the market, even on the seashore where there is practically no charge for transportation. Lobsters in the maritime provinces are sold for five or ten cents a pound. In New York the prices vary from 25 to 40 cents a pound whether lobsters are plentiful or scarce. In the New England markets the prices also appear too high for a food taken from the sea. An inquiry into the question of lobster prices leads to the impression that there is an understanding among dealers as to how much the fishermen shall receive and how much the customer shall pay. The Canadian Minister of Marine and Fisheries, in the annual report of his department for 1910, said that the position of Halifax and St. John, at one time capitals of the lobster fisheries, had passed away.

Lock-outs. See LABOR STRIKES.

Locomotives. During 1910 a locomotive was delivered to the Atkinson, Topeka & Santa Fe Railroad, which weighed 350 tons, the largest on record. At the same time a locomotive similar in type, but for passenger trains, was built for the same road, weighing 305 tons. To use locomotives of such great weight it was necessary to have the roadway specially prepared, and in anticipation of the advent of similar, if not still larger, locomotives, preparations are being made on all important railroads in the way of firmer roadbeds and heavier rails. A tremendous pull is exerted by these monster locomotives upon making curves, and only road beds carefully constructed can be used with safety.

Both the engines referred to were of the compound articulated Mallet type, which has increased the pulling power of an engine 50 per cent in comparison to its weight. The Mallet type has been used chiefly for freight, heretofore, a branch of railroading which it has completely revolutionized, but the new Santa Fe passenger engine shows its adaptability to passenger service, especially in the handling of heavy trains over the mountain grades. The Mallet in this connection is destined to replace

the "helper," as the Mallet in itself is really two engines and is capable of handling very large trains over steep grades. Since the introduction of compound engines freight trains composed of 72 loaded cars are not uncommon.

The size of engines has increased so rapidly that it is anticipated that it will not be long before 500 tons will be reached. Much heavier rails and more solid road beds will be necessary, in fact, it will practically mean the rebuilding of every road over which they are run, but the increased power will much more than make up for the increased cost.

The largest locomotive in existence has practically the whole of its 350 tons on its driving wheels, giving a tractive force of 54 tons. The heating surface is 6,621 square feet, its steam pressure 220 pounds, its superheating and reheating surfaces 1,745 square feet. The two high-pressure cylinders are 26 by 34 inches and the two low-pressure cylinders 38 by 34 inches. Every ounce of heat is saved and used until the last possible effort from it has been utilized. It uses superheating, reheating, feed-water heating and compounding.

A distinctly new feature of these two locomotives is this saving of heat and transforming the locomotive from a wasteful to an economical consumer of fuel. The boilers being unusually long, as in all articulated types, it has been possible to make use of the heat saving devices. The boiler terminating above the high-pressure cylinder, in constructing the engine the space forward has been utilized by two nests of fire tubes through which the hot gases pass on their way to the smoke-stack. The first of these nests is divided into a superheater and reheater and the other into a feed water heater. In the old types of locomotives the gases, emerging from the fire tube, although still very hot, are permitted to pass directly out of the smoke-stack, wasting the additional energy. But by this new device these gases are so manipulated that they return a larger part of their heat to the engine and boiler. First they help raise the temperature of the steam as it passes from the steam-dome to the high-pressure cylinder and then does an equal service to the exhaust steam as it passes from the high-pressure to the low-pressure cylinders. After this has been done the gases pass among the tubes where the feed-water circulates and raises its temperature as it passes from the tank on the tender to the boiler.

These economies have never been applied all at once to locomotives before, but have proved that they can save 50 per cent of the fuel consumption.

The largest passenger locomotive differs somewhat even from the big compound engines already in existence. The firebox is built of steel plates riveted together with stay plates between the opposite flanges of the outer and inner shell. The fire tubes are 21 feet long and pass on the gases into a combustion chamber 10 feet, 9 inches long, where the superheater and reheater are placed. From there the gases pass into the forward combustion chamber through 417 tubes $2\frac{1}{4}$ inches in diameter and 6 feet 8 inches long, heating the feed water.

Outwardly the boiler and the two combustion chambers form one whole and are encased in an outside covering which holds them rigidly to the frame which contains the high-

LOCOMOTIVES—LONDON

pressure cylinders The low-pressure cylinders, as in all Mallet types, are carried on a separate frame and the most difficult feat in the construction of these engines is to secure an equal balance of the weight between the two sets of driving wheels, giving all wheels equal tractive power This has been accomplished in the biggest engine to a nicety. The half of the weight resting on the forward drivers, propelled by the low-pressure cylinder, is carried upon two sliding bearings allowing the frame to move laterally under the boiler when the locomotive rounds a curve The steam pipes are of necessity also flexible, but this is attained by the use of slip and ball-and-socket joints

The tender is in itself large It is carried on two six-wheel trucks, has a capacity for 4,000 gallons of oil and 12,000 gallons of water The engine boiler which it supplies is 6 feet in diameter and has 202 square feet of heating surface in the fire box, 3,275 square feet in the fire tubes and 1,279 square feet in the feed-water tubes, a total of 4,756. The superheating and reheating surfaces alone are 1,121 square feet

The boiler on the 350 ton locomotive is 7 feet in diameter with a pressure of 220 pounds and has a heating surface, including feed-water heating, of 6,631 square feet In addition the superheating and reheating surface is 1,745 square feet.

In the proposed locomotives which are even larger, in order to give room for the boiler without rebuilding tunnels, the whole top of the locomotive will have to be leveled. The smoke stack is practically done away with already under the new economical use of heat, the cab top can be lowered and the bell, which has remained on the saddle of the locomotive since locomotives were first built, will also have to go

It is even suggested than a still longer engine can be constructed than the Mallet compound by having three sets of driving wheels, instead of two, but this will probably not become a reality, as under present developments such an engine would not give enough additional power to compensate for the increased weight

Electro-turbo Locomotive—An entirely new type of locomotive, based on new principles, has been evolved by the North British Locomotive Company It is a steam-turbine-electric, and the hope of the manufacturer is that it will take the same place on land that turbine engines have taken at sea. A dynamo generates the electricity which actuates the motors, and this is driven by a steam turbine engine which in its turn receives its power from an ordinary locomotive boiler of modern construction, fitted with superheater. The engine and tender are all in one piece, the coal bunkers on one side, and the water tank on the other side of the boiler.

The advantage in this combination of high-pressure power can be seen in the fact that the turbine makes 3,000 revolutions a minute and transfers the generated power to a continuous-current, variable voltage dynamo, which supplies current and pressures varying from 200 to 600 volts to four series-wound traction motors, the armatures of which are on the driving axles.

As the turbine requires no internal lubrication, the exhaust steam passes to a condenser and is redelivered to the boiler by a feed pump, where it is again converted into steam Small auxiliary steam turbines do this work. The locomotive being deprived of the usual exhaust blast through the fire box and boiler tubes, the blast is replaced by means of the small turbine-driven fan, within the cooler, which not only delivers hot air to the furnace, but returns the air to the cooler.

If entirely successful, this engine may in large part supplant engines now requiring a third-rail. The fire-box is small and the consequent dirt is much reduced. The locomotive has had successful runs on English railways. On its trial trip it ran from Glasgow to Garts-herrio on the Caledonian and North British railways.

The locomotive is not difficult to handle, in spite of its complicated construction

Locusts. See INSECTS, DESTRUCTIVE.

Lodge, Sir Oliver Joseph, author: b Penkhull, Staffordshire, England, 12 June 1851. He was educated at the Salop grammar school at Newport, and the University College of London, and received the honorary degrees of D Sc. from Oxford, Victoria, and Liverpool universities, and that of LL D from St. Andrew's, Glasgow, and Aberdeen universities. He was professor of physics at the University College, Liverpool, 1881-1900, Rumford medallist of the Royal Society in 1898; and Romanes lecturer at Oxford University in 1903. He was created a knight by King Edward VII in 1902 and was a fellow of the Royal Society. His publications include 'Elementary Mechanics'; 'Modern Views of Electricity'; 'Pioneers of Science'; 'Signalling without Wires'; 'Lightning Conductors and Lightning Guards'; 'School Teaching and School Reform'; 'Easy Mathematics for Parents and Teachers'; 'Life and Matter'; 'Elections'; 'The Substance of Faith' and 'Reason in Belief.' He also is the author of 'Ministers and Stewards' and the 'Man and the Universe', which were based on articles in the *Hibbert Journal*.

Loeb, William, Jr., American politician: b Albany, N. Y., 9 Oct 1866. He received a High School education; was stenographer of the New York Assembly 1888, private secretary to several public officials in New York, stenographer to the New York State Constitutional Convention, 1894; to the Grand Jury and District-attorney, 1895-98; and in 1899 was appointed private secretary to Gov. Theodore Roosevelt, at Albany, N. Y. On the election of Governor Roosevelt to the vice-presidency, 4 March 1901, he was retained as secretary and was assistant secretary to the President 1901-03, and secretary 1903-09. On 9 March 1909 he was appointed collector of the port of New York and at once instigated a purification policy, lifting the customs service out of a rut and enforcing the law. He reorganized his department, eliminated the "graft" element and kept politics out of the service.

London, Jack, American author: b San Francisco, Cal., 12 Jan. 1876; educated at University of California. In 1908 Mr. London further distinguished himself by setting forth in a world-girdling voyage in a little boat he built himself, *The Snark*. This craft was

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wrecked but not until he nearly half-finished his daring journey. A record of this trip in the form of vivid letters appeared in the *Woman's Home Companion* beginning in the January (1909) number. In May 1909 Mr. London was heard from in a hospital at Sydney, Australia, stating that he had succumbed to the inroads of no less than five tropical diseases! However, later in the year saw the publication of his novel, 'Martin Eden' In 1910 Mr. London came forth with a play, 'Theft,' strongly reflecting his socialistic ideas. It endeavors to point the apotheosis of anti-plutocracy, but it is so overdone that its effect must be quite opposite to that intended. 'Burning Daylight' also appeared in the latter part of 1910

Longevity. Investigations into human longevity are constantly being made. While much of the newer material may be said to cover the same ground as the older researches, some of these newer investigations are of considerable, practical interest. A few of them may be summarized

Recent investigations into the relationship of occupation to longevity have furnished the following facts. The professional occupations are the healthiest, on the whole—the medical, the legal, and the clerical. Of these, the latter is the healthiest, by far. The average life of lawyers also exceeds that of the general community by 27 years. There is some conflict of opinion in regard to the medical profession. French figures indicate that medical men outlive others. Swiss figures, on the contrary, would seem to indicate that they are slightly shorter lived than the majority. Those who have the shortest lives,—according to these figures,—are coal-heavers, messengers, dock-laborers, costermongers, and general laborers—the last having the lowest figures of all. Their average seems to be about 28 years,—or nine years lower than the average death rate. The high death rate of those engaged in these occupations seems to be due, not to the generally hazardous character of their occupations, but because of the fact that their work is intermittent and uncertain; and this class is formed largely from the derelicts of other occupations.

Important contributions to the subject also are those of Metchnikoff, whose books 'The Nature of Man' and 'The Prolongation of Life' have caused a profound sensation. His theory is that the man dies chiefly by reason of auto-intoxication, which, in turn, is due to the action of bacteria in the large intestine. His theory is that, if we could but kill these bacteria, the length of man's life would be increased very greatly. He accordingly addressed himself to the problem of how to remove these bacteria; and he came to the conclusion that the bacilli formed in soured milk were fatal to their existence; and hence advises all his patients to drink soured milk. (See MILK, SOURED.) Metchnikoff also believes that practically the whole human race dies prematurely; and that all the so-called "natural" deaths are, as a matter of fact, premature. He contends that, if death were really natural, it would be craved, as sleep is craved at the end of a long day's labor. His theories and researches have given rise to bitter controversy, but have stimulated other inquirers to ascertain the facts for themselves.

An important contribution to the subject, also, from the philosophical side, is the book by M. Jean Finot—'The Philosophy of Long Life'. The author attempts to give us a system of practical optimism—based on the theory that conscious immortality is not a fact in nature, but that, in spite of that, death need not frighten us. His book presents many paradoxes, but has been considered of considerable importance, nevertheless, because of the novel manner in which many of his arguments are presented.

Bearing upon this question of human longevity, or the lengthening of human life, is the question of the practical means to be taken for prolonging it—apart from those advised by Metchnikoff. An interesting circumstance, in this connection, is the statement, recently made by Dr. Eugene Louis Doyen, of Paris, of a modern "elixir of life" in the shape of his preparation, mycolysine. Doctor Doyen—who is a specialist on cancer—believes that this disease, when it has not progressed too far, can be cured, together with most diseases of the digestive organs and respiratory tract, and that human life can be prolonged for, from 15 to 20 or more years by means of mycolysine. It is said to kill both poisons and germs. Doctor Doyen has studied the effects of the drug for a number of years, and has watched many cures effected by its means (so it is said), before making it public. What the outcome of his researches will be, it is as yet too soon to say;—save that all similar "elixirs" in the past have been shown to be more or less complete failures.

There can be no doubt, however, that man dies prematurely, and that a large portion of his life is cut off by his habits of life, and by unhygienic living. Doctor Wiley, of the Government Bureau of Chemistry, has recently asserted that every man ought to retain his health and vigor for at least 70 years—while, as a matter of fact, the present average death-rate is about 42 years. Simplicity of living is the key-note to this improved method of life; and in this opinion, he is virtually in agreement with every authority upon this subject.

As to centenarianism, there is a great conflict of opinion. Dr. J. H. Kellogg, of Battle Creek, says there are 2,000 centenarians in Hungary, and 3,000 in the United States. Dr. Woods Hutchinson, on the other hand, holds that there is not one centenarian living, and that there probably never was one. Examination of the historic cases of centenarians, he asserts, have yielded negative results. Other opinions differ. Thus, a year or so ago, Germany claimed 78 centenarians; France, 213; England, 146; Scotland, 46; Denmark, 2; Belgium, 5; Sweden, 10; Norway, 23; Spain, 410; while the Balkan States laid claim to one centenarian to every 100 of the population. These figures are disputed in other quarters. A detailed, statistical inquiry into this question is undoubtedly much needed.

There has always been a saying among physicians that "a man is as old as his arteries"; but whether they will last a year or 20 years is a problem the solution for which has never been found. Lately, however, Dr. Arnold Lorand, of Karlsbad, ('Old Age Deferred,' Phila., 1910), has advanced the view that old age is not a matter of arteries at all, but rather of

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glands, and particularly the ductless glands, such as the liver, the kidneys, the thyroids, and the adrenals. The vital phenomena are all under the influence of the internal secretions of the ductless glands; hence if we but ascertain the condition of these glands, the condition of the individual can be gauged therefrom. Symptoms of old age appear (according to Doctor Lorand) because of changes in the ductless glands. Our appearance, the condition of our tissues, immunity—all depends upon the condition of these glands. Thus, the condition of old age is closely associated with their condition. They degenerate from various causes; some physical, some mental. All mental emotions especially have a very disorganizing effect upon these glands. Doctor Lorand summarizes his theory, briefly, thus:

"The symptoms of old age are the result of breakdown of the tissues and organs which, owing to shrinking of the blood vessels, are insufficiently supplied with blood, and, owing to the disappearance of nervous elements, are devoid of proper nervous control.

"Degeneration of the ductless glands and of the organs can not be simultaneous, for the latter are under the control of the former. These glands govern the processes of metabolism and nutrition of the tissues, and by their incessant antitoxic action protect the organism from the numerous poisonous products—be they of exogenous origin, introduced with air or food; or endogenous, formed as waste products during vital processes. After degeneration of these glands, the processes of metabolism in the tissues are diminished, and there is an increase of fibrous tissue at the expense of more highly differentiated tissue. It is evident from the above considerations that all hygienic errors,—be they errors of diet or any kind of excess,—will bring about their own punishment; and that premature old age, or a shortened life, will be the result. In fact, it is mainly our own fault if we become senile at sixty or seventy, and die before ninety or a hundred.

"Not only age, but the majority of diseases are due to our own faults in undermining our natural immunity against infections, and subjecting our various organs to unreasonable overwork and exertion. We do not believe that the worst slave driver of olden days subjected his slaves to such treatment as we do our own organs, and especially our nerves. At last they must rebel, and disease, with early death or premature old age, will be the result."

The relations of marriage to longevity have lately been discussed by Dr. Jacques Bertillon, who maintains that married people live longer than the unmarried—the reason being that they live more regular lives, and, in their physical and moral habits are more even than those who are unmarried. He bases his estimate on figures derived from France, Germany, Austria, Italy, Sweden, Holland, and Belgium. Unmarried women, dying at the age of 20 or 25, are twice as numerous as the married of the same age. A similar great disproportion exists throughout, and the general conclusion arrived at is that marriage does undoubtedly lengthen life in the majority of cases.

Loomis Institute. The death of Mrs. Mary Hunt Loomis (widow of Col. John Mason Loomis), in Chicago, early in Oct. 1910, made

available about \$1,500,000, which, with funds already in trust, assured cash resources exceeding \$2,000,000, for the founding of the Loomis Institute, in the Connecticut Valley, whose object is to furnish a technical education to the youth of both sexes who are members of the Loomis family. Although an exponent of strong American ideas and ideals, it is a family memorial, erected on the site of the first house built by a Loomis in America—the original homestead of Joseph Loomis who fled from persecution in Braintree, Eng., in 1638 and settled in Windsor, Conn., the following year. The homestead has been in the possession of the family since 1639, passing down in unbroken regular succession from Joseph Loomis to Col. John Mason Loomis. It is at present occupied by Miss Jennie Loomis, the corresponding secretary of the Institute, and her mother.

The founding of the school is attributed to Col. John Mason Loomis, of Chicago, Hezekiah B. Loomis and Osbert B. Loomis, of New York, James C. Loomis, of Bridgeport, and Mrs. Abbie Hayden, of Windsor. None of them having children to inherit the large properties which each possessed, they entered into a compact to bequeath their fortunes to found a technical school which should perpetuate the family name. The charter of the Institute states that "In case a greater number of persons having the requisite qualifications shall apply for admission than the Institute can accommodate, then selection from said applicants shall be made, first from those belonging to the State of Connecticut, next from those deemed most worthy without regard to State or Nation, as determined by the trustees." The president of the trustees is John M. Taylor.

The Loomis Family of America, of which Burdett Loomis, a wealthy Hartford business man, is president, is engaged in raising an endowment fund for the Loomis Institute. As the organization includes several hundred of the first families in New England, it is probable that, from either a social or financial standpoint, the new educational venture will have abundant resources.

Los Angeles, Cal. According to the 1910 census, the 17th city in size, having a population of 319,198 and an area of 61 2-3 square miles. Los Angeles has 1,200 miles of streets of which 91 are paved. The city debt is \$19,710,062 and the annual cost of the city government, \$2,229,318, of which \$1,723,604 is for schools having 52,065 pupils and 1,315 teachers and principals; \$498,199 for the fire and \$438,212 for the police departments. The annual death rate is 14.24 and births 16.84. The assessed value of the real estate is \$307,079,995, and the personalty, \$24,657,334. Los Angeles owns its water works. They cost \$5,654,000. There are 407 2-5 miles of mains. The average daily consumption of water is 40,000,000 gallons. There are 482 miles of sewers. Many lives were lost and a score were hurt in a fire that completely destroyed the Los Angeles *Times* Building on 1 Oct. 1910. The fire was preceded by a series of heavy explosions on the second floor, which was used as a composing room. It has been charged that the dynamiting was due to labor troubles. Los Angeles is governed by what is known as the commission form of government (q.v.). Its new charter has been

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used as a model for many cities adopting it. Some of the noteworthy features are the initiative and referendum (q.v.) and the recall (q.v.).

Louisiana. A State of the West South Central Division of the United States, with an area of 48,720 square miles (3,300 square miles being water). The capital is Baton Rouge, though the largest city in the State is New Orleans with a population of 339,075 in 1910. The population of Louisiana was (1910) 1,656,388. This was an increase of 274,763 or 19 per cent in the past 10 years. The population per square mile is 36.5. Louisiana ranks 24th in population.

Agriculture.—The products and manufactures of Louisiana are various. The chief crops in 1910 were corn, 58,835,000 bushels; rice grown on 371,000 acres, yielding 12,469,000 bushels, valued at \$8,555,000; cane sugar, 750,400,000 pounds. For 1909-10 the yield of cotton is estimated at 134,036,000 pounds. Oats, potatoes, hay, and tobacco are also grown, but not so extensively. In 1910 there were 500 acres under tobacco, the yield being 275,000 pounds. In 1910 the State contained 200,000 milch cows, 480,000 other cattle, 178,000, sheep, and 744,000 swine.

Mining and Manufactures.—The sulphur output for the past two years is not stated, but wells for the extraction of sulphur by means of hot water and air at the surface have been in active operation. The petroleum output is about 6,835,130 barrels (valued at \$4,200,000 per annum). Another mineral worked is rock salt, of which, in 1909, 950,000 barrels valued at about \$250,000 were produced. The total mineral output in 1908 was valued at \$12,113,000. The manufacturing industries are chiefly those associated with the products of the State: sugar, lumber, cotton-seed, rice, etc. At the last census there were 2,091 manufacturing establishments which employed altogether 2,977 clerks, and 55,859 wage earners. The material used cost \$117,035,305, and the output was valued at \$186,379,592. The State has a large forest area and extensive lumber industries. The following are the more important industries with their capital: Sugar and molasses, \$54,872,060; lumber products, \$37,385,028; cotton-seed oil and cake, \$8,686,711; rice cleaning, etc., \$6,138,228; bags (not paper), \$1,145,384; foundry work and machinery, \$3,843,989; and cars, railway works, \$1,474,097.

Fisheries.—Louisiana has valuable fisheries. Oyster reefs extend almost continuously along the coast, and the oyster fisheries are the most valuable south of Virginia. The persons employed in the fishing industries of Louisiana, exclusive of the packing and canning establishments and wholesale fish dealers, number about 6,000. The number of vessels is about 250, valued, including outfit, at \$450,000; the number of boats, 4,500 valued at \$360,000. The value of apparatus of capture is estimated at \$95,000; the value of accessory property and cash capital, \$41,000; the value of products, \$1,600,000 per annum.

Government.—The Governor of Louisiana is J. Y. Sanders, with a salary of \$5,000. The Lieutenant-Governor is P. M. Lambemont; Secretary of State, J. T. Mitchell; Auditor, Paul Capdeville; Treasurer, O. B. Steele; Attorney-General, Walter Guion; Superintendent of Education, T. H. Harris; Commissioner of Agriculture, Charles Schuler; Commissioner of Insur-

ance, Eugene J. McGuney; Commissioner of Public Lands, Fred J. Grace—all Democrats.

Finance.—The total assessed valuation of Louisiana in 1910 was \$529,419,403. The tax rate per \$1,000 was \$5. The bonded debt was \$11,108,300. For the biennial period, last given, the receipts for all funds (including transfers and balances from former periods) and the disbursements were Receipts, \$6,232,631, and \$6,628,502. Disbursements, \$1,862,692, and \$5,209,179. The Balances were \$1,369,939 and \$1,419,323.

Religion and Education.—Most of the Southern States are Protestant, but over 61 per cent of the population of Louisiana are Catholic. Of Protestants in the State, Baptists and Methodists are the most numerous, than Protestant Episcopalians and Presbyterians. According to the State constitution no funds raised for the support of the public schools of the State shall be appropriated to or used for the support of any private or sectarian school. In 1909-10 the common schools had 7,431 teachers and 264,493 enrolled pupils, with an average daily attendance of 187,641. In 1909 the public high schools had 190 teachers and 2,998 pupils. The two public normal schools had 41 teachers and 812 students in 1908. Superior instruction is given in the Louisiana State University and Agricultural and Mechanical College. The university was opened in 1860, and the college in 1874; on 1 June 1877, they were by law united into one and the same institution with its seat at Baton Rouge. In 1909 the institution had 38 professors and 569 students. Tulane University (founded in 1834) had, in 1909, 165 professors and 1,564 students. This university has State support to the extent of the remission of certain taxes. There are also two Catholic colleges, one with 21 professors and 189 students, the other with 25 professors and 374 students, a large Baptist College with 28 professors and 423 students; and at New Orleans the Southern University for colored persons with 390 enrolled students. There is an industrial Institute at Ruston and another at Lafayette.

Charities and Corrections.—Besides almshouses and asylums for imbeciles, etc., Louisiana has 56 benevolent institutions, most of which have been provided by private persons or ecclesiastical bodies. They comprise 10 hospitals (four public), 25 orphanages, 17 homes for adults (two public), and three schools for the deaf and blind (two public). In 1909 28,116 inmates were admitted. The police juries provide for the support of the poor in their parishes, except in municipal corporations wholly or partly exempt from parish taxation; they may establish a home or farm for their paupers and appoint suitable officials. The revenue account of the Louisiana State Penitentiary for 1909-10 was as follows: Revenue on hand, 1 Jan. 1909, \$17,968.02; received from work on levees, \$222,215.91; from all other sources, \$194,576.69; total, \$416,792.60. Used to pay notes and interest, \$8,480. Paid into the State Treasury, \$371,975.47. Balance, 1 Jan. 1910, \$54,305.15.

Lovett, Robert Scott, American lawyer: b. San Jacinto, Texas, 22 June 1860. He attended the public schools and the high school at Houston, Texas; obtained employment on the construction of the Houston, East and West Texas Railway; studied law with Col. Charles Stewart, of Houston; was admitted to the bar 22

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Dec 1882 and practiced in Houston. He was attorney for the Houston, East and West Texas Railway Co, 1884-89, removed to Dallas, Texas, and was assistant general attorney of the Texas and Pacific Railway Co, 1889-91, and general attorney, 1891-92. He was a member of the law firm of Baker, Botts, Baker and Lovett, at Houston, and became general attorney and counsel for all the lines of the Southern Pacific Railway in Texas, 1 Jan. 1904. He was general counsel for the Union Pacific and Southern Pacific Railway Companies and their affiliated lines, known as the "Harriman System," and on the death of Mr. Harriman, 13 Sept. 1909, he was made chairman of the executive committee and president of the system.

Lowell, Abbott Lawrence, American educator and author b. Boston, Mass., 13 Dec. 1856. He prepared for college in the best secondary schools of Paris, France, and Boston, Mass., and was graduated from Harvard University A.B. 1877, LL.B. 1880. He was admitted to the bar in 1880 and practiced in partnership with Francis C. Lowell, and later with F. J. Stimson. He was an active member of the Boston Public School Association, a member of the Boston School Committee; succeeded his father as a trustee of the Lowell Institute, was made a member of the Corporation of the Massachusetts Institute of Technology; was lecturer at Harvard 1897-99, professor of the science of government at Harvard, 1900-09 and on 6 Oct. 1909 was inaugurated as 22d president of Harvard University as successor to Charles William Eliot resigned. The honorary degree of LL.D. was conferred on him by Williams College in 1908, and by Columbia, Princeton, Yale, and Louvain universities and Dartmouth College in 1909. Doctor Lowell is the author of 'Transfer of Stock in Corporations,' (with Francis C. Lowell, 1884), 'Essays on Government' (1889); 'Governments and Parties in Continental Europe' (1896); 'Colonial Civil Service' (with H. Morse Stephens, 1900); 'The Influence of Party Upon Legislation in England and America' (1902); and 'The Government of England' (1908).

Lowell Memorial. A fountain has been constructed in Corlears Hook Park, just south of Grand street, New York, as a memorial to Mrs. Josephine Shaw Lowell, the charity worker, who died in 1906. She was the widow of Capt. Charles Russell Lowell, who was killed in battle during the Civil War. Following his death, Mrs. Lowell devoted her life and fortune to charity. She was appointed a member of the State Board of Charities by Governor Tilden and was also prominent as an advocate of playgrounds in New York. A memorial fund committee, of which ex-Mayor Low was president, raised \$15,000 which was spent on the erection of the fountain.

Ludden, Patrick Anthony, R. C. bishop: b. in county Mayo, Ireland, 4 Feb. 1836. He attended St. Jarlath's college, Tuam, Ireland, and in 1854 came to America where he completed his education in the Grand Seminary at Montreal, Can. He was ordained priest by Mgr. Ignatius Bourget at Montreal, 21 May 1864, and was assistant pastor of the Cathedral of the Immaculate Conception, Albany, N. Y., and secretary and chancellor to Bishop Conroy.

pastor of St. Joseph's Church, Malone, N. Y., and vicar-general of the diocese of Albany, 1877-80; was theologian to the Bishop of Albany at the plenary council of Baltimore; pastor of St. Peter's Church, Troy, N. Y., 1880-87, and on 1 May 1887 was consecrated first bishop of the newly formed diocese of Syracuse, N. Y., Archbishop Corrigan acting as consecrator, assisted by Bishops Loughlin and McNierny. Bishop Ludden is the author of 'Church Property' (1882).

Lueger, Charles, (or Karl), Austrian political leader b. Vienna, 24 Oct. 1844, d. 14 March 1910. He was educated at the gymnasium and at the University of Vienna where he was graduated in 1866, beginning his public life as a lawyer and a Liberal. In 1872 he was appointed secretary of the Liberal Club of Vienna, in which the Jewish element predominated, and attracted much attention by his criticism of the municipal administration. In 1882 he proclaimed himself leader of the anti-Semites and opposed international capitalism organized by Jews,—the system permitting individuals to manage public business for their private advantage. The Austrian press, largely controlled by Jews, answered his attack, and a bitter controversy ensued. In 1885 he was elected a representative in Parliament where he carried on his attacks on the Jews in Austria and the Magyars in Hungary. In 1895 he was elected vice-burgomaster of the city of Vienna, but his election was not confirmed by the Emperor until April 1897, when he was made burgomaster. Henceforward till his death, Lueger reigned as the uncrowned King of Vienna. Under his administration Vienna became the beautiful and brilliant city it is to-day. He took over the Viennese gas works from an English company and put it under city control; introduced electric lighting of the streets and electric trains; built a great municipal slaughter house, and established central markets, and in 10 years brought Vienna up to the level of the great European cities; yet, although the outlay was enormous, the interest on the loans was not increased, being covered by the profits. Doctor Lueger was awarded the grand cross of Franz-Joseph Order, and was an honorary freeman of the city of Vienna.

Lumber. The lumber cut in the United States during the calendar year of 1909 was 44,585,000,000 feet, board measure, as against 33,224,000,000 feet in 1908 and 40,256,000,000 feet in 1907. This was an increase of 3.42 per cent over 1908, and 10.8 per cent over 1907. The output of lath and shingles during 1909 was 3,712,000,000 and 14,945,000,000, respectively. The increase in the production of lath in 1909 over 1908 was 24.3 per cent and over 1907 13 per cent, while the corresponding increase for shingles was 23.4 per cent and 26.4 per cent.

In coöperation with the forest service of the Department of Agriculture, the Bureau of Census annually collects and publishes statistics pertaining to the group of lumber and timber industries.

The substantial increase over the two preceding years was general, few of the individual States showing a decreased cut. The figures for 1908 and 1907 were collected by mail and, while including the commercial mills of the

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country, did not in many cases cover the small neighborhood mills whose output was consumed locally. The relatively large increase in the number of mills reporting for 1909, together with the increase in the cut for that year, was due largely to the fact that the field force of the Census Bureau, which was engaged in gathering statistics of all branches of manufacture throughout the United States, secured returns from practically every sawmill in operation during the whole or any part of 1909, without regard to its size, and in this way there have been included many small mills not covered by the mail census in the preceding years.

In the group of coast States, from Virginia to Texas, inclusive, together with Arkansas and Oklahoma, there stands probably not less than nine-tenths of the present supply of yellow pine stumpage. The proportions of the total cut of lumber in the United States contributed by this group, together with Kentucky and Tennessee, has been steadily increasing during the recent years. In 1907 their output was 17,834,000,000 feet or 44.3 per cent of the total; in 1908, 15,056,000,000 feet, or 45.3 per cent of the total, and in 1909, 22,057,000,000 feet or 49.5 per cent of the total. Yellow pine, including several species, longleaf, shortleaf, loblolly, culean, etc., constitute substantially the same per cent of the total cut of lumber in these states in each of the three years, furnishing 72 per cent in 1909, 72.8 per cent in 1908 and 72.4 per cent in 1907. The large increase in the number of mills reporting from this region in 1909 over 1908, namely from 12,824 to 23,255, amounted to nearly two-thirds of the total increase in the number of mills reporting from the entire United States between these years.

The proportion of the total lumber cut of the country contributed by New York and the New England States did not vary materially during the three years, being 9 per cent in 1907, 9.6 per cent in 1908, and 7.5 per cent in 1909.

Although the wood pulp industry continues to make heavy and increasing draught upon the supply of spruce, this tree still practically shares with white pine the place of first importance among the lumber timbers of this region. In 1909 its contribution to the total lumber cut of this group of States was 28.8 per cent, while that of white pine was 21.1 per cent.

The relative importance of the lake States—Michigan, Minnesota, and Wisconsin—in lumber production, continues to decrease steadily as the supply of white-pine stumpage grows less. These States contributed 13.6 per cent of the total lumber cut of the United States in 1907, 13.2 per cent in 1908, and 1.23 per cent in 1909.

The Pacific Coast States, with an output of 28.3 per cent larger in 1909 than 1908, and 2.2 per cent greater than in 1907, nevertheless contributed a smaller proportion of the total cut of the country in 1909 than in either of the preceding years, the percentage for 1909 being 15.5, for 1908, 16.2, and for 1907 16.8. Douglas fir was far in the lead as lumber material in these States during the three years, the production from these species constituting 68.1 per cent in 1907, 66.1 per cent in 1908, and 68.5 per cent in 1909. It contributed 79.2 per cent of the total production in Washington in 1909, and

83.2 per cent in Oregon, while redwood formed 45.6 per cent of the total output in California.

The supply of hickory, the East American fuel wood, and the most difficult to replace in case of a shortage of American hardwoods, is approaching exhaustion, according to bulletins of the Department of Agriculture. The government points out that virgin hickory, the chief source of supply, is disappearing rapidly, and that there are no foreign sources which can be drawn upon when the home supplies are gone. Prices are bound to advance because of the high technical value of hickory and the fast diminishing supply.

Hickory has a number of important special uses for which no satisfactory substitute is known; fully 40 per cent of the merchantable hickory cut each year is washed, the total amount consumed each year being not less than 50,000,000 feet. 65 per cent of the total cut is utilized as vehicles of industry. There are now about 100,000,000 acres of land upon which hickory is growing naturally.

Hickory and its exhaustion, however, illustrates but one phase of the deterioration of the American forests because of lack of scientific conservation, yet the lavish manner in which the United States has consumed the products of its forests and the rapidity with which our timber supply is melting away are wholly unappreciated by those who have never given the matter more than passing consideration. Familiar, as all are, with the use of wood for every purpose and in every industry, it is only when various items are added that there begins to come a realization of the indispensable place the forests fill in the national economy. A conservative statement of the present yearly output shows that to furnish the various wood products is never less than 20 billion cubic feet. The United States is now using annually 400 board feet of lumber per capita, while the average for Europe is but 60 feet per capita.

Five groups of States embrace the naturally timbered areas of the country—the Northeastern States, the Southern States, the Lake States, the Rocky Mountain States, and the Pacific States. Of these, the two groups last mentioned are occupied by forests in which practically all the timber-producing trees are coniferous, the first three by both conifers and hardwoods. The earliest attack was upon the white pine of the northeast, the original stand of which is almost entirely cut out. The present stand in the Northeastern States is mainly spruce, second-growth white pine, hemlock, and hardwoods.

The Southern States produce essentially four types of forests, which may broadly be said to divide the land among them according to elevation above sea level. The swamp forests of the Atlantic and Gulf coasts and the bottom lands of the rivers furnish cypress and hardwoods. The remainder of the coastal plain, Virginia to Texas, was originally covered with southern or yellow pine—the trade name under which the lumber of several pines is marketed. The plateau which encircles the Appalachian range and the lower parts of the mountain region itself support a pure hardwood forest, while the higher ridges are occupied by conifers—mainly spruce, white pine, and hemlock.

LUNCH ROOMS — MACAO

The Lake States still contain much hardwood forest in their southern portions. In the north the coniferous forest includes, besides the rapidly dwindling pine, considerable tamarack, cedar, and hemlock.

The chief timber trees of the Rocky Mountain forest are western yellow and lodgepole pine, while the Pacific forest is rich in the possession of half a dozen leading species — Douglas fir, western hemlock, sugar and western yellow pine, redwood, and cedar.

As the timber in any region becomes scarcer, the minimum cutting limit is constantly lowered, and the timber is taken which was formerly rejected. In New England, for example, 6 inches is now a common cutting diameter for white pine, while in some localities on the Pacific coast nothing below 18 inches is cut.

No one who is at all familiar with the situation doubts for an instant that we are rapidly using up our forest capital. In fact, it is unquestionably safe to say that our present annual consumption of wood in all forms is from three to four times as great as the annual increment of our forests. Even by accepting the highest estimate of the amount of timber standing we postpone only for a few years the time when there must be a great curtailment in the use of wood if the present methods of forest exploitation are continued. See MESSAGE, PRESIDENT'S.

Lunchrooms, School. See SCHOOL LUNCH-ROOMS.

Lutheran Church. An evangelical Christian denomination, founded at the time of the Reformation in Europe, and now the largest of the Protestant churches, numbering throughout the world nearly 80,000,000 communicants. The Lutheran Church in America, in 1909, included 67 synods, 13,400 churches, 8,300 ministers, and 2,700,000 members. There are 10 mission boards having charge; foreign missions in Africa, India, China, Japan, Madagascar, Siberia, South America, and Persia. The Church in educational work supports 114 institutions with property of \$2,000,000. Its benevolent institutions numbering upward of 200, representing \$7,200,000. The year 1908 marked the unification of the Home Mission of the General Council and the organization of a new English Synod in Canada, the beginning of work in Japan by the General Council and in South America by the General Synod; conferences in the Northwest with Norwegian Lutherans with a view to close union, and the dedication of the Krauth Memorial Library of the Philadelphia Theological Seminary. In 1909 the Church published three volumes, treating on the 'Confessions of the Lutheran Church.' The recent statistics are as follows: General Council: 2,393 congregations; 1,565 ministers; 471,563 members; 303,043 Sunday school scholars; \$492,420 contributed for benev-

olent offerings; and church property valued at \$23,288,909. General Synod: 1,346 congregations; 1,320 ministers; 284,808 members; 230,952 Sunday school scholars, and \$18,344,453 in church property. Synodical Conference (German): 3,278 congregations; 2,620 ministers; 735,866 members; 217,736 Sunday school scholars; and \$614,639 for benevolent offerings. The regular convention convened at Seward, Neb., in May 1910. United Synod of the South: 451 congregations; 32,872 Sunday school scholars, 240 ministers, 493,774 members; \$56,914 for benevolent offerings; \$1,714,140 value of church property. Last convention met at Winchester, Va., Sept 1910. Independent Synods: 5,510 congregations, 2,604 ministers, 657,494 members; 281,267 Sunday school scholars; and \$728,736 for benevolences.

Luther Burbank's Work. See HORTICULTURE, LUTHER BURBANK'S WORK IN.

Luxemburg. Lying in central Europe, with boundaries formed by France, Belgium, and Germany. The area is about 999 square miles, and the population 250,900. Luxemburg city, an old fortress, has about 20,700 inhabitants. The inhabitants of the country are principally Roman Catholics. The Grandduke Wilhelm, born 1852, is the sovereign of the country, the royal power passes to his daughter upon his demise. There is a Chamber of Deputies in the government, elected to terms of six years by the people of the administrative divisions, half the Chamber is renewed every three years. Luxemburg, previously belonging to the German Confederation, became neutral territory in 1867, and in 1890 it came under the sovereignty of the Duke of Nassau. The government receipts for 1910 amounted to \$3,568,300, and the expenditure to \$3,716,650. At the end of 1909 the public debt was \$2,049,750. Iron ore is one of the principal resources of the principality. There were about 5,440 miners working the mines in 1908, and the production was valued at \$3,394,200. Railway lines extends a total length of about 330 miles; telegraph lines about 680 miles (227 offices); and 74 telephone systems, 1,030 miles. Depositors in the Savings Bank of Luxemburg number 50,000, with an aggregate credit of \$10,000,000 principal alone.

Lynching. The number of lynchings in the United States during 1910 was not so great as in previous years. There was a total of 66, as against 3,287 in the past 25 years. This year's lynchings took place in the following States: Alabama, 8; Arkansas, 8; Florida, 15; Georgia, 10; Kentucky, 1; Louisiana, 3; Mississippi, 5; Missouri, 2; North Carolina, 1; Ohio, 1; Oklahoma, 1; South Carolina, 1; Tennessee, 2; Texas, 7; West Virginia, 1. Of those lynched 58 were negroes and 8 white; 63 were men and 3 were women. Murder caused 26, rape 14.

MACAO. A small centre of Portuguese influence, on an island called Maceo, at the mouth of the Canton river, China. The area is only about four square miles. The population in 1900 was 64,000, of whom about 3,900 were whites. Two small islands called Taipa and Coloane form with Macao proper, the Portuguese province, and are comprehended in

these figures. The city is composed of two divisions, Chinese and "Foreign," and each division looks after its own administration, which is conducted by a sort of governor. The revenue for 1909-10, as estimated, was about \$640,000, and the expenditure the same. The imports into the province in 1908 were valued at about \$9,348,700, and the exports abroad at

\$8,877,500. The trade is principally controlled by the Chinese. 1,895 steamers and 4,650 junks entered at the port in 1908.

McClung, Thomas Lee, United States government official. b Knoxville, Tenn., 26 March, 1870. After graduating from Yale in 1892 he traveled extensively, and in 1894 became paymaster of the St. Paul and Duluth Railroad, with headquarters at St. Paul. From 1898 to 1904 he was connected with the Southern Railway Company in several responsible positions. In 1904 he was made treasurer of Yale University which position he resigned 1 Nov. 1909, at the earnest solicitation of President Taft, to accept the treasurership of the United States.

McCormick, John Newton, second P. E. bishop of Western Michigan and 230th in succession in the American episcopate. b Richmond, Va., 1 Feb. 1863. He was graduated A B Randolph-Macon College in 1883, and B D the same year. He took a post-graduate course at Johns Hopkins University, 1886-88, and was ordained to the ministry of the Methodist-Episcopal Church of the South in 1884, and was pastor at Frederick, Md., 1884-85, Arlington, Md., 1885-87, of Trinity Church, Baltimore, 1888-89, and at Winchester, Va., 1890-91. His religious views changing, he joined the Protestant Episcopal Church, was ordered deacon in 1893 and advanced to the priesthood in 1894, and was rector of St. Paul's, Suffolk, Va., 1893-94, St. Luke's, Atlanta, Ga., 1895-98; and of St. Mark's, Grand Rapids, Mich., 1898-1906. He was elected coadjutor to the Rt Rev George De Normandie Gillespie, bishop of the diocese of Western Michigan, and was consecrated 14 Feb 1906, Bishops Tuttle, Gillespie, and Nelson officiating. On the death of Bishop Gillespie, 19 March 1909, he succeeded to the diocese as second bishop of Western Michigan. The honorary degree of D D was conferred on him by the University of the South in 1903. He is the author of 'Distinctive Marks of the Episcopal Church' (1902); 'The Litany and the Life' (1904); and 'Pain and Sympathy' (1907).

McDowell, Edward Alexander, American composer and pianist. b. in New York City, 19 Dec. 1861; d. 1908. He was educated in Paris and Germany, and was head of the Darmstadt Conservatory to 1884; professor of music at Columbia University (1896); director of the Mendelssohn Glee Club of New York (1896-98); and president of the American Society of Musicians (1897-98). His compositions include 'Woodland Sketches'; 'Forest Idylls'; 'Lancelot and Elaine,' etc. In 1910 it was discovered that the works attributed to one Edgar Thorne were composed by McDowell, who used the pseudonym because he modestly believed his glee club might sing any songs he himself wrote as they would feel obliged to do so. At the same time he determined never to touch the royalties received from the Thorne compositions. He used directions for musical expressions and shading also such as no other composer would use, and always in the English language, for example, 'Gaily, pertly,' 'Not slow, liltily.' His compositions published under his pseudonym include 'Amourette'; 'Forgotten Fairy Tales'; 'Sung Outside the Prince's Door'; 'Of a Tailor and a Bear'; 'Beauty and the Beast'; 'From Dwarfland'; 'Six Fancies for the Piano'; 'A Tin Soldier's

Love'; 'To a Humming Bird'; and 'In Lifting Rhythm'.

McFarland, John Horace, master printer, author and lecturer in the field of "outdoor journalism" b McAllisterville, Pa., 24 Sept. 1859. After a private school education at Harrisburg, he learned the printing business, and established himself in it in 1878. He is secretary and treasurer of the J Horace McFarland Company, operating the Mount Pleasant Press, which he established in 1889. From 1890 to 1893 he printed and contributed to 'American Gardening,' which was published by the Rural Publishing Company, of New York, and edited by Prof. L H Bailey (now dean of the College of Agriculture of Cornell University). Profiting by this acquaintance, Mr McFarland suggested to Doubleday, Page & Company the general idea which bore fruit in the magazine *Country Life in America*. He designed its format, printed it during the first three years of its existence, made many of its covers and nearly all of its contents designs and supplied it with hundreds of photographs and articles, until its publishers established their own printing plant in 1904. Immediately, the same interest was continued through the request of the Review of Reviews Company that he undertake the making of *The Country Calendar*. Then came *Suburban Life*, which continues to supply an outlet for his "outdoor" printing. He is a contributor *The Outlook*, *Collier's Weekly*, and other magazines, and conducted the "Beautiful America" department of the *Ladies Home Journal* from 1904 to 1907. He is the author of 'Photographic Flowers and Trees' (1902); and 'Beginning to Know the Trees' (1904); and has been photographic illustrator for other publications, notably *Bailey's Cyclopedia of American Horticulture*. He is secretary of the Municipal League of Harrisburg, a member of the Harrisburg Park Commission since 1905, and president of the American Civic Association since 1904. His activities in civic improvement began in 1889 when he was one of seven men to organize the successful campaign in Harrisburg for the erection of a viaduct, for which a bond issue was effected in 1902. From 1902 to 1904 he was president of the American League for Civic Improvement, and from 1903 to 1904 was a member of the executive board of the National Municipal League.

McGarick, Alexander Joseph, American R. C. bishop. b Fox Lake, Ill., 3 Aug. 1863. His parents came from county Antrim, Ireland, in 1849 and settled in Fox Lake where he attended the public schools. He was graduated from St. Viateur's College, Kankakee, Ill., A.B. 1884, studied theology and was ordained priest in Chicago, Ill., in 1887. He was curate of All Saints Church, Chicago, 1887-98, and pastor of St. John's Church, 1898-1900. In the latter year he was chosen pastor of Holy Angels Church, Chicago. His work as pastor of St. John's caused his election as auxiliary bishop of Chicago in 1899 and he was consecrated at the cathedral of the Holy Name, 1 May 1899, receiving the title of bishop of Marcopolis and auxiliary bishop of Chicago. Archbishop Feehan acted as his consecrator, assisted by Bishop Spalding of Peoria, 12 bishops and nearly 300 visiting priests being present. Bishop McGarick continued as pastor of Holy Angels Church, combining his pastoral duties with those of

this bishopric. He is the author of 'Some Incentives to Right Living' (1909).

McGillicuddy, Daniel John, American politician. b. Lewiston, Maine, 27 Aug 1857. He was graduated from Bowdoin College A.B. 1881; studied law; was admitted to the Bar, and established himself in practice at Lewiston in 1883. He was elected mayor of Lewiston in 1887, 1890, and 1902, was a member of the State legislature, 1884-85, and was the unsuccessful Democratic candidate from the 2d district of Maine, for election to Congress, in 1906, and 1908, but was elected a representative to the 62d Congress in Sept 1910, taking his seat 4 March 1911, his term expiring 4 March 1913. His district is the one so long represented by Nelson Dingley and later by Charles E. Littlefield, and with the exception of the Hon. L. D. M. Sweat, in 1863, he is the first Democrat elected to represent the State of Maine in Congress since 1855.

McGoldrick, James, R. C. bishop. b. Tipperary, Ireland, in 1841, and was educated for the priesthood at All Hallows College, Dublin, Ireland. In 1867 he was ordained priest and was appointed assistant pastor of the Cathedral at St. Paul, Minn. He came to the United States and entered upon his work, serving at the cathedral until 1868 when he was made pastor of the Church of the Immaculate Conception. On 27 Dec 1889 he was consecrated first bishop of the newly formed diocese of Duluth, Minn.

McKim, John, second missionary. P. E. bishop of Tokio and 167th in succession in the American episcopate: b. Pittsfield, Mass., 17 July 1852. He was graduated from Nashotah House, Wis., in 1879, having been ordered a deacon at All Saints Cathedral, Milwaukee, Wis., 16 June 1878, and was ordained to the priesthood by the bishop of Fond du Lac, the Rt. Rev. John Henry Hobart Brown, in 1879. He worked a short time in the Diocese of Chicago, and in 1880 was sent to Japan as a missionary in the district of Tokio, which was under the charge of the Rt. Rev. Channing Moore Williams. He made his headquarters at Osaka, and founded 17 stations in the district. In March 1893 he was elected bishop of the missionary district of Tokio, as successor to Bishop Williams, who had resigned in 1889, and was consecrated in St. Thomas' Church, New York City, 14 June 1893. Bishops Littlejohn, Lyman and Dudley officiating as consecrators. The honorary degree of D.D. was conferred on him by Nashotah Theological Seminary in 1893, by Trinity College in 1893, and by Oxford University in 1908. When the Japan mission was divided into two missionary districts, Tokio and Kioto, which are also separate districts of the Nippon Lei Kokwai or Japan Church, Bishop McKim retained the diocese of Tokio, and Bishop Williams assumed the charge of the Kioto district until the election of the Rt. Rev. Sidney Catlin Partridge, who took charge in 1900.

Mack, Julian William, associate justice of the United States Supreme Court. b. San Francisco, Cal., 19 July 1866. He attended the public schools of Cincinnati and was graduated from Harvard LL.B. 1887. He took a post-graduate course at the universities of Berlin and Leipzig and was admitted to the bar in 1890. He was professor of law at Northwestern University, 1895-1902, and at the University of

Chicago, 1892-1910. He was appointed a civil service commissioner in Chicago in 1903, judge of the Circuit Court of Cook County, Ill., 1903-10; judge of the Juvenile court of Chicago, 1904-07, and judge of the Appellate court for first district of Illinois, 1909-10. He was president of the National Confederation of Jewish Charities, president of the Milk Commission, of the League for the Protection of Immigrants, and of the Friends of Russian Freedom; vice-president of the Children's Hospital, a member of the executive committee of the National Confederation of Charities and Corrections, and of many other philanthropic, and civil societies. He is a member of the American Bar Association, the Illinois State Bar Association and the Chicago Bar Association. In 1910 he was appointed by President Taft an associate justice of the United States Supreme Court, and his nomination was confirmed by the Senate on 15 Dec. 1910.

MacKaye, Percy Wallace, American dramatist. b. New York, 16 March 1875. After graduating at Harvard in 1897 he travelled in Europe for a year and studied two years at the University of Leipzig. After returning to New York he taught in private schools until 1904, since which time he has engaged in lecturing and in play writing; his lectures, on the American drama, being delivered at Chicago, Ann Arbor, Harvard, Yale, Columbia, and other universities. His plays were at first poetic in character, on traditional themes, but latterly he has turned to contemporary prose comedy. His poetic dramas lacked the definite, sharp outline necessary to a full success, and all his work shows too much solicitude for literary perfection—"The language of a Harvard senior showing off," as one critic puts it; but there is a freshness and vigor and gathering power in his later plays that are full of promise. The list includes 'The Canterbury Pilgrims,' (a comedy, 1903, performed at Harvard, Yale, and other universities in 1909, and given a civic pageant, Gloucester, Mass., 4 Aug 1909, in honor of President Taft); 'Feuris the Wolf' (a tragedy, 1905); 'Jeanne d'Arc' (1906, produced by Sothorn and Marlowe in America and England); 'Sapho and Phaon' (a tragedy, 1907, produced by Harrison Grey Fiske); 'The Scarecrow' (1908); 'Mater' (1908), produced by Henry Miller; and 'Anti-Matrimony' (1910, in which Henrietta Crossman took the leading rôle). His principal poems are 'Ode on the Centenary of Abraham Lincoln' (which was delivered before the Brooklyn Institute, Feb 1909); 'Ticonderoga and Other Poems' (1909). He is an earnest exponent of a Civic Theatre for America, and wrote, partly in its advocacy, 'The Playhouse and the Play' (1909).

Macomb, Montgomery, American military officer. b. in Michigan, 12 Oct. 1852. He entered West Point 1 Sept. 1870, and was graduated in June 1874, and was assigned as a second lieutenant to the 4th Artillery. His first station was at the Presidio of San Francisco, where he remained until Dec 1874, when he was sent on frontier duty to Fort Wrangel, Alaska. He returned from that territory in June 1875, when he was appointed aide-de-camp to Brevet Major-Gen. Montgomery C. Meigs. He accompanied that officer abroad in August 1875, when he was sent to study the constitu-

tion and government of the European armies. Returning to the United States in April 1876, he served on engineering duty on Lieutenant Wheeler's geographic explorations, and was on that staff until Dec 1883, in the meantime having been promoted to first lieutenant in Sept. 1879. He was graduated from the Artillery School in 1886, and was at the Military Academy as assistant professor of mathematics from Aug 1887, until Aug. 1888, and then of drawing until April 1891. When relieved, he was placed in command of corps No. 1 of the Central American division of the Intercontinental Railway Commission. He was made captain in the 7th Artillery on 8 March 1898, and was in the field in the Porto Rican campaign from July until Sept. 1898. He reached his majorship in Nov. 1901, and was with the Russian army in Manchuria from the beginning to the end of the Russo-Japanese war in 1905. He was promoted to lieutenant-colonel on 26 March 1906, colonel on 5 April 1907, and on the reorganization of the artillery arm in June of that year he was assigned to the 6th Field Artillery. When General Myer (q. v.) retired on 14 Nov. 1910, Colonel Maccomb was appointed to succeed him. He was at this time a member of the General Staff, on duty in the office of the Chief of Staff in Washington, serving as a chief of the field artillery, and was considered one of the most efficient officers in that branch of the service. His assignment, when appointed a general officer to succeed Gen. A. L. Myer, was to the new military district of Hawaii.

MacVeagh, Franklin, American government official. b. in Chester County, Pa. He was graduated from Yale in 1862 and then studied law; admitted to the bar in 1864, and practiced in New York for two years. He then went to Chicago and established the firm of Franklin MacVeagh & Co., wholesale grocers, of which he remained the head until in 1909. He was also interested in many manufacturing and banking enterprises and philanthropic movements; especially as president of the Citizens Association of Chicago, in 1874, he inaugurated many municipal reforms. On 4 March 1909 he was selected by President Taft as Secretary of the Treasury of the United States.

Madagascar. The fourth largest island in the world, lying off the coast of southeast Africa; since the 15th century under French dominion.

Area and Population.—The maximum length and breadth of the island are 975 and 350 miles, respectively, and the area is about 226,000 square miles. At the beginning of 1908 the population numbered about 2,706,650, of whom 9,700 were Europeans, 3,600 were Asiatics, and 2,000 Africans. There were about 75,100 births, and 63,400 deaths among the natives in 1907. The chief towns and their inhabitants (1901) are: Antananarivo (the capital), 72,000; Fianarantsoa, 4,500; Ambositra, 3,000; Tulcar, 2,900; Mananjary, 2,600; Andovoranto, 5,600; Tamatave, 7,000; and Majunga, 4,600. The last two named are ports on the east and west coasts respectively.

Government and History.—Native sub-officials perform a great many of the minor duties of government. The chiefs who are favored of the people are as a rule appointed to such offices as they can fill consistently with good

government. There is a Council of Administration at the capital. Military combined with civil officers carry out the administration, the former having control of 5 out of the 19 districts of the Island. By 1890, after several years of trouble in Madagascar, France was recognized as the legitimate protector of the Island, by Great Britain, although the natives resisted the encroachments of the French. Not until 1897, however, was the native queen succeeded by the Resident-General, the colony having been declared such the previous year.

Finance and Banks.—The revenue for 1908 was estimated at \$6,257,850, and the expenditure the same. The colony cost France about \$3,034,800 for 1910. The debt outstanding at the beginning of 1908 amounted to about \$20,063,700, and was chiefly incurred for public works. The postoffice and general administration consume a large proportion of the revenue. The principal sources of revenue are land, house, and personal taxes, customs, indirect taxes, colonial lands, posts, etc. As a sequence to the abolition of slavery in Madagascar, the natives are subjected to from 10 to 30 francs per capita taxes. Italian money pieces are in circulation in the country, but the 5-franc coin (silver), its sub-divisions, and copper coins are the only legal money. There is a private bank in the Island, and a French banking house from Paris has branches in six of the most important cities.

Justice, Public Instruction, and Religion.—Justice is administered among the natives in district and provincial tribunals, from which appeal may be made eventually to the Governor-General. There are justices of the peace in 17 localities, four courts of first instance in as many towns; a court of appeal; and a supreme court, or Parquet. Study of the French language is obligatory in Madagascar, as is general education for children between 8 and 14 years. Native schools in 1907 numbered 720: 690 primary, with 1,330 teachers and 56,000 pupils; 14 professional, 1 administrative, and 15 normal, with 118 teachers and professors, and 1,530 scholars. Elementary schools for Europeans in 1907 were attended by nearly 1,000 pupils. Missionaries in the colony are assiduously promulgating secular instruction. Catholic missions had about 260 members in 1895, and Protestant about 175. There are approximately 500,000 nominal Christians in the country, nine-tenths of whom are Protestants.

Products, Industries, and Trade.—The cultivated area is about 848,200 acres in extent. The principal products of the land, which is let or sold to individuals or companies, are rice, manioc, sugar, coffee, cotton, cacao, vanilla, tobacco, cloves, mulberry trees, rubber trees, and sweet potatoes. Caoutchouc is the chief article of agriculture. Gums, resins, dye-plants, and medicinal plants are abundant. The forests produce valuable woods of various kinds. Stock-raising is an important industry. There are about 1,950 horses and mules, in the island; 2,860,400 cattle; 264,100 sheep; 63,350 goats; and 479,100 swine. Silk-weaving and cotton-weaving, the manufacture of palm-fibre cloth, and metal works, are among the country's industries. Sugar-works, soap-works, breweries, etc. are being established by Europeans. The mineral resources comprise gold, iron, copper, lead, silver, zinc, antimony, manganese, nickel, sulphur, graphite, and lignite. About 101,250 ounces (troy) of gold were produced in 1908.

The total imports into Madagascar in 1908 were valued at \$5,882,500, and the exports from the colony at \$4,529,850. The leading imports were: tissues (approximately), \$2,391,000; spirits, \$616,750; metal wares, \$590,000; coal, stone, etc., \$394,750; flour, \$244,500; and colonial products, \$234,750. The exports were chiefly as follows (figures approximate): gold, \$1,889,000; rubber, \$252,000; hides, \$640,500; raffia, \$363,500; wax, \$249,500; and vanilla, \$208,500. The country's trade is carried on principally with France and its colonies, Great Britain, and Germany. The total import and export trade with France in 1908 amounted to about \$5,733,000.

Shipping, Railways, Posts and Telegraphs — Vessels entered and cleared at the ports of Madagascar in 1908, about 7,250. Regular steamers ply between the most important ports, and the vessels of three French shipping-companies visit the seaport of Tamatave. There are almost 200 miles of railway open, which with a canal connects the capital with Svanie-vano. The telegraph lines have a total length of 3,450 miles, telephone lines, 130 miles. There are postoffices throughout the colony, and the service is good.

Maes, Camillus Paul, American R. C. bishop. b. Courtrai, Belgium, 13 March 1846. He was graduated from the college of Courtrai in 1864, studied theology in the seminary at Bruges and at the American college at Louvain and was ordained a priest in the Mechlin Cathedral, Belgium, by Mgr. Antonio, 19 Dec 1868. He emigrated to the United States in 1869 and was assigned to the diocese of Detroit, Mich. Later in the year he was appointed pastor of St. Peter's Church, Mt Clemens; in 1871 of St. Mary's Church, Monroe, and in 1873 of St. John's Church, Monroe, Mich. He was chosen by Bishop Borgess to be his secretary in 1880 and served until 1884 when he was elected bishop of Covington, Ky. He was consecrated 25 Jan 1885 in St. Mary's Cathedral by Archbishop Elder, assisted by the bishops of Louisville, Ky, and Detroit Mich. Bishop Maes was a member of the board of directors of the Catholic University of America and was permanent president of the Eucharistic Congresses. He was editor of the *Emmanuel* the organ of the Eucharistic league, and is the author of 'Life of Rev. Charles Nerinck' (1880). It was during his bishopric that the \$500,000 cathedral at Covington, Ky., was completed.

Maeterlinck, Maurice, Belgian poet and dramatist. b in Ghent, Belgium, 29 Aug 1862. He attended a Jesuit school, studied law, and in 1887 was admitted to practice, but in 1896 he abandoned the law profession and engaged in literary pursuits in Paris. His first work, a collection of verses entitled 'Serres Chandes,' was published in 1889, and he added to this collection 'Dorize Chansons' in 1896. His dramas are symbolic or mystic in treatment, and are pervaded by melancholy to such a degree that they are seldom produced on the stage, they include 'La Princesse Maleine' (1889); 'Les Avengles' (1890); 'L'Intruse' (1890); 'Les Sept Princesses' (1891); 'Pelleas and Melisande' (1892); 'Allodine et Polomides: Interieur' (1894); 'Mort de Tintagiles' (1894); 'Aglaraine et Selysette' (1896); 'Ardaine et Barbe Bleue' (1901); 'Monna Vanna' (1902); 'Joyzelle' (1903); 'The Blue Bird' (1909); and 'Mary Magdalene' (1910). A collection of

his dramas, translated by Richard Hovey, appeared in 1896 and 1901. His philosophical essays are 'Le Tresor des Humbles' (1896); 'La Sagesse et la Destinee' (1898); 'Le Temple Euseveli' and 'La Vie des Abeilles,' a study of bee life translated into English by Alfred Sutro (1891). In 1905 a translation of 'Monna Vanna' by William Winter, was produced in New York city, and in 1910 a translation by A. T. De Mattas of 'The Blue Bird,' an allegorical or fairy play in five acts and two scenes, was produced at the New Theatre, New York city, and was received with great interest by the public, who pronounced it the dramatic event of the season.

Magnetism, Physiological Effects of. Several years ago, Lord Lindsay, (now the Earl of Crawford) conducted a series of experiments, in which the effects of magnetism upon the human body were studied. The result of these experiments was to show, apparently, that the magnetic field had no effect upon the human organism — a result which had also been arrived at in 1886 by Professors Jastrow and Nuttall. (See *Proceedings Amer. Soc. Psy. Res.*, pp 116-26). More recent investigations by Professor Thomson, however, have shown that this early verdict, so confidently arrived at, at the time, is incorrect, and that magnetism does have an appreciable effect upon the body. A real physiological effect has been shown to exist. In a recent article in the *Edison Monthly*, it is said:

"Some six years ago, when experimenting with an electromagnet which had been constructed to show his well-known experiments on the repulsion of copper rings, he observed a faint visual effect when his forehead was placed close to the magnet. He recently found the means of producing the visual effect (which is subjective and physiological) in a way that succeeds with every person on whom it has been tried. An alternating magnetic field of sufficient intensity and extent was produced by passing an alternating current around a specially constructed magnetizing coil.

"On inserting the head into the interior of the coil in the dark, or with the eyes closed, there is perceived over the whole region of vision a faint, flickering illumination, colorless or of a slightly bluish tint. The period of the flicker is not well defined. It does not seem to be the same over the whole region of vision at the same time, nor is it equally bright over the whole region of vision, but is sometimes brighter in the peripheral region than in the central parts. Even in daylight, with the eyes open, one is conscious of a sensation or flicker superposed upon the ordinary vision.

"The effect is diminished by lowering the intensity of the field, and increased by raising it. Attempts to discover whether the brightness of the phenomenon stands in any relation to the direction of the axis of the field with respect to the directions of the principal axis of the skull have not yet revealed any definite result. It will be necessary to apply more intense fields than have yet been tried. No after-effects of any kind have been experienced, either by Professor Thompson or by any of the persons who have made the experiments with him."

These newer experiments, therefore, seem to conform the earlier views and experiments in this direction — for example, those of Baron

Reichenbach, who contended that the magnetic field had a definite action upon the physical organism. At the time, he was laughed at, and, after a number of further experiments, all yielding negative results, it was decided that it was useless to look further, since nothing would ever be found. Yet fuller knowledge has reversed this conclusion—as we have seen more than once in the history of scientific research and endeavor.

Maine. A State of the New England division of the United States with an area of 33,000 square miles, of which 29,895 square miles is land. The capital is Augusta. The population of Maine in 1910 was 742,371, being an increase of 47,905 or 6.9 per cent in the past 10 years. The population of the State per square mile is 24.8. Maine ranks 34th in population.

Agriculture.—The products of Maine are derived chiefly from agriculture, forestry, quarrying, and fisheries. The State has, besides other attractions, excellent hunting and fishing, and is a favorite summer resort. The soil is not generally fertile, an important exception being that of the Aroostook Valley, which is well adapted for the growing of fruit and vegetables. The number of farms reported in 1910 was 59,773, as compared with 59,299 in 1900. The total value of farm lands and buildings was given, in 1910, as \$158,676,000, the total value of farm land alone being \$85,923,000. In 1910 the value of the farm land alone constituted 54 per cent of the total value of farm land and buildings. The reported value of farm implements and machinery was \$14,476,000, the total acreage reported was 6,291,000 acres, as compared with 6,300,000 in 1900, a decrease of 9,000 acres or 0.1 per cent. The average acres per farm reported in 1910 was 105. The average value per acre of farm land and buildings in 1910 was \$25. The expenditures for labor in 1910 reached the sum of \$5,591,000. The expenditure for fertilizers amounted to \$4,003,000. The cereal crops for 1910 were as follows: Oats, 5,554,000 bushels; corn, 782,000 bushels; wheat, 267,000 bushels; barley, 248,000 bushels; potatoes, 27,940,000 bushels; hay, 1,750,000. In 1910 the farm animals comprised 119,000 horses, 175,000 milch cows, 139,000 other cattle, 254,000 sheep, and 62,000 swine. The wool clip amounted to 810,000 pounds of scoured wool, valued at \$453,000 in 1907.

Mining and Manufactures.—In the State are large granite works, cotton mills, paper mills, manufactures of clothing, etc. In 1908 the quarries yielded granite to the value of \$2,027,508; slate, \$213,707. In the State there are mineral springs, which yield 1,182,322 gallons, valued at \$394,346 per annum. The value of the total mineral output in 1908 was estimated at \$4,044,678. In 1905, when the last census enumeration of manufactures was made, the State had 3,145 manufacturing establishments employing altogether 3,772 salaried officials, and 74,958 wage-earners. Their aggregate capital amounted to \$143,707,750; the cost of raw materials in a year, to \$80,042,090, and the value of a year's output to \$144,020,197. The leading industries with their capitals are: Textiles, \$39,195,079; lumber and timber, \$15,083,395; lumber, planing, etc., \$2,003,304; boots and shoes, \$4,450,939; fish canning, etc., \$2,144,690;

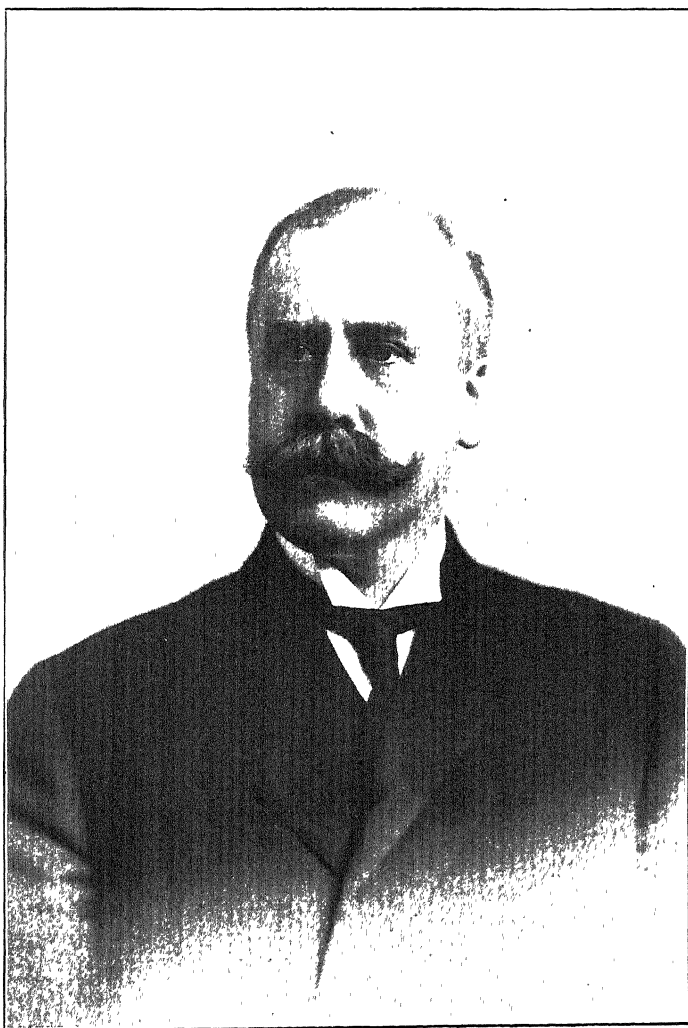
foundry, etc., \$5,191,274, flour and grist, \$1,422,671, printing, etc., \$2,107,149, shipbuilding, etc., \$1,221,691, leather, \$1,464,735. The principal seaport is Portland, through which, in 1909, merchandise to the value of \$1,573,386 was imported, and merchandise to the value of \$12,861,973 exported. The exports were meat products, cattle, wheat, and maize. In 1909 there were 2,173 miles of railway and 412 miles of electric railway within the State. The railways connect with the Canadian railway systems.

Fisheries.—In the fishing industry of the State 6,861 persons were employed in 1908. Vessels numbered 575, value including outfit, \$1,006,543, boats, 6,969, value, \$662,490; value of apparatus of capture, \$576,262; value of accessory property and cash capital, \$165,655; value of products, \$3,256,581.

Government.—The Governor of Maine is Frederick W. Plaisted, with a salary of \$3,000. The Secretary of State is A. I. Brown, Treasurer, P. P. Gilmore, Adjutant-General, Elliot C. Dill; Auditor, Lamont A. Stevens; Attorney-General, Warren C. Philbrook, Superintendent of Education, Payson Smith; Insurance Commissioner, Beecher Putnam, Commissioner of Agriculture, A. W. Gilman, Commissioner of Public Lands, E. E. Ring—all Republicans, except Plaisted and Stevens, who are Democrats. There is a legislature of two Houses, the Senate, containing 31 members, and the House of Representatives, with 151 members, both Houses being elected at the same time for two years. The suffrage is possessed by every registered male citizen of the United States, 21 years of age, who can read English and write his own name, but paupers and untaxed Indians have no vote. For local government the State is divided into 16 counties, sub-divided into towns, cities, plantations, and various unincorporated places.

Finance.—As no part of the bonded indebtedness of the State became due in 1909 it remained the same as in the previous year, viz., \$698,000,000. The receipts during the year 1909 were \$3,396,850, cash on hand 1 Jan. 1909, \$568,534, expenditures during 1909, \$3,889,561; leaving a balance on hand, 31 Dec. 1909, of \$75,823. The assessed valuations of Maine are: Realty property, \$345,572,709; personal property, \$82,639,756; total, \$428,212,465.

Religion and Education.—The largest religious body is the Catholic Church, then come Baptists, Congregationalists, Methodists, and Protestant Episcopalians. Education is free for pupils from 5 to 21 years, and compulsory from 5 to 14. The State Superintendent has general supervision over education; there are no county superintendents. Cities and towns have elective school attendance committees. In 1909 the 4,624 common schools had 6,792 teachers and 212,329 enrolled pupils. The 219 free high schools had 13,862 pupils. There are 41 academies, institutes, and seminaries, with, in 1909, 3,626 enrolled pupils. State summer schools are held at Gorham, Farmington, Castine, Presque Isle, Fort Kent. For the training of teachers there were five public normal schools with 39 teachers and 701 students. The University of Maine, founded in 1868, at Orono, has 90 professors and teachers, and 884 students. It is endowed by and receives large appropriations from the State. Bowdoin College, founded in 1794, at Brunswick, has 57 professors and 420



F. W. PLAISTED.
GOVERNOR OF MAINE.

MAINE BOUNDARY TREATY

students. Bates College at Lewiston has 17 professors and 429 students, and Colby College, at Waterville, has 17 professors and 283 students. Public schools are mainly supported by appropriations from the towns or cities and from the State, and by the income from school funds.

Charities and Corrections—Apart from almshouses and asylums for the insane, etc., there are 43 benevolent institutions in the State, nearly all being provided by private or ecclesiastical charity. They comprise 12 hospitals (one public), 10 orphanages (one public), 20 homes for adults (one public), and a school for the deaf (public). In 1909, 7,643 inmates were admitted, and at the end of the year there remained 4,015. Blind children are sent to an institution at Boston, at the expense of the State, which also makes grants in aid of charitable associations. The overseers of towns have charge of the poor and of the poor farm and buildings, and may cause all their paupers to be supported there, but veterans may not be sent to an almshouse. Towns may contract for the support of their poor. Settlement is obtained by residence for five successive years without poor relief, and entitles a pauper to support. Parents, grandparents, children, and grandchildren are liable for each other's support. It is a punishable offence to bring a pauper into a town where he has no settlement. Towns are reimbursed by the State for the support of a pauper who has no legal settlement in the State.

Legislation—There was no regular legislative session in 1910. In 1909 an act was passed creating a commission to assist in the topographical survey of the State; to set about the formation of a forest reserve and to have charge of plans of reforestation. Other acts were to prohibit the transmission of electricity generated from water powers in Maine across the borders of Maine without special charter therefor from the State, to restrict to 58 the hours for women and children in all cotton-mills and other factories, except sardine factories and corn shops, and a new code of military laws governing the National Guard of Maine.

History—In Sept. 1910, Maine, hitherto steadfastly Republican, elected a Democratic governor in the person of Frederick W. Plaisted. Maine's total vote in the State election was the greatest ever cast in a Presidential mid-term year and was exceeded only by the Presidential election years of 1880, 1884, and 1888. The total vote was 141,584. The governor got 73,801 votes, or a plurality of 8,114. His vote was almost identical with that given his father, Harris M. Plaisted, the last Democratic Governor of Maine, who, in 1880, received 73,713 votes. The total in that year, 147,802, has never been exceeded in Maine. The election of a Democratic governor is likely to bring about certain changes in the prohibition laws of the State.

Maine Boundary Treaty. The year 1910 witnessed the final settlement of the long standing dispute as to the boundary line between Maine and New Brunswick. Secretary of State Knox, acting for the United States, and Ambassador Bryce, on behalf of Great Britain, signed a treaty which establishes the exact boundary of Maine for all time.

At the close of the Revolutionary War in 1783 the first attempt was made to fix a satisfactory boundary, but it resulted only in hopeless dissatisfaction. Ever since that time the matter has remained one for ceaseless wrangling and dispute. Scarcely a diplomat has been sent to this country from England but has been called upon to familiarize himself with the Maine-New Brunswick boundary situation; while the state department of this country has gone over the ground so many times that that performance had almost come to be regarded as one of the regular duties of the department. Hope of ever reaching a final and satisfactory arrangement of the question had long since been abandoned.

Most boundary lines are fixed by nature; those which are not do not as a rule amount to a great deal, and an amicable settlement can usually be reached at once. With the Maine-New Brunswick line, however, neither of these conditions have ever applied, particularly in that part which has so long been in dispute. This particular line runs through Passamaquoddy Bay, along the little islands at the mouth of the St. Croix River. As a result of its indefinite character there has been endless dispute and strife among the fishermen who frequent these parts; dispute which has had an industrial significance since both the Eastport and Lubec canneries have sent their men to this point, and it makes a vast deal of difference whether they are fishing in American or Canadian waters.

The source of all the trouble was the looseness with which the first treaty, that of 1783, was drawn up. Article II of that document reads:

"And that all disputes which might arise in future on the subject of the boundaries of the said United States may be prevented, it is herein agreed and declared that the following are, and shall be, their boundaries, viz. From the northwest angle of Nova Scotia, viz. That angle which is formed by a line drawn due north from the source of the St. Croix River to the Highlands; along the said Highlands which divide those rivers that empty themselves into the river St. Lawrence from those which fall into the Atlantic Ocean, to the northwesternmost head of the Connecticut River," etc.

Thus, while the St. Croix was plainly named as the beginning of the eastern boundary, the only point mentioned was the source of the river, and not a word was said about its mouth or the numerous islands of the great bay into which it empties. Moreover, there arose at once the questions as to what was the St. Croix River. The trouble loomed up at the very start. The first action toward a settlement was taken in 1794 when John Jay was charged to adjust the matter. All he was able to accomplish, however, was a provision in his treaty of that year for the appointment of three commissioners to determine just what was the St. Croix River. These commissioners met at Halifax in 1798 and determined the river, but neglected to mention its source and made no disposition of the islands at its mouth. Subsequently there were treaties, conventions and declarations between the United States and Great Britain relative to this subject in 1814, 1818, 1827, 1842, 1846, and 1870, but in every instance there was something still left to be adjusted around the mouth of the river.

The treaty of Ghent in 1814 provided for

commissioners to settle the matter and they decided that Moose, Dudley, and Frederick Islands belonged to the United States, while all the other islands, including Grand Menan, were the property of Great Britain. This was very good as far as it went, but it left unsettled the status of several small islands in the St. Croix and of the line itself through the bay. The channel thus remained in dispute.

In addition to this, trouble soon arose over the boundary line northward and westward from the source of the St. Croix. The original treaty had been exceedingly vague on this subject, and finally in 1827 the King of the Netherlands was named as referee to conclude the dispute. After failing for a long time to satisfy either party with any of his suggestions, he drew a line to suit himself, awarding part of the disputed territory to Maine and part to New Brunswick. The United States rejected this arrangement, while in the meantime the disturbances on the border kept becoming more and more serious. Operations of the 1830 census takers in the contested area created much feeling, and eight years later an American lumber dealer was thrown into jail by New Brunswick officials—the act having much to do with though no blood was spilled in this it came the precipitation of the Aroostook war. Al-very near maturing into a third war with England. A joint occupation was agreed upon as a temporary compromise, before Daniel Webster and Lord Ashburton came together in 1842 and drew up the famous treaty which settled all dispute as to that particular part of the boundary line.

It has been related as an historical fact that in these negotiations both nations withheld maps which were unfavorable to their claims. The Americans had one which had been discovered but a short while before in Paris, and was supposed to have been drawn up by Benjamin Franklin, while in the possession of the English was one made by Richard Oswald, who was one of the commissioners who negotiated in the treaty which gave the United States its independence. Later both nations showed these maps to their own people in evidence of how conclusively they had got the best of the bargain. Up to the present time, however, the United States has always regarded the signing of this treaty of 1842 as a diplomatic triumph.

The treaty of 1842, however, made no mention of any part of the boundary south of the monument which had been erected at the source of the St. Croix, and until Secretary Knox and Ambassador Bryce signed their treaty of 1910 the lower part of the line in places was still contested. But with the signing of this latest treaty and the final settlement of the whole chaotic matter no point now remains between the United States and Canada which is in the slightest dispute.

Maine, Raising of the. The first work undertaken by the army engineers toward raising the *Maine*, on 3 Jan. 1911, revealed the fact that a portion of the coal bunkers had been blown outside the vessel by the force of an inward explosion. This indicated either that the vessel had been destroyed and sunk from within, as maintained by Spain, or that an interior explosion had occurred after the vessel had struck Spanish mines sunk in the harbor of Havana. Which theory is correct can only be fully ascertained by raising the battleship

and examining all the evidences. Since the vessel had not been touched previous to the work which began early in 1911 all the evidence remained intact and a final decision will be reached as to the cause of the disaster. There has been shown no desire to conceal the facts and, if the \$300,000 appropriated for the work is not sufficient, the attitude of Congress is to appropriate all that is necessary and settle forever the mystery of the sinking of the *Maine*.

The battleship was sunk on the evening of 14 Feb. 1898, and, although a board passed on the cause of the disaster, it was not possible to decide absolutely without raising the vessel. Admiral French E. Chadwick, who has been active in the efforts to secure adequate legislation, wrote at the time of the board's report, "We can afford to say we are mistaken, we cannot afford the imputation of fearing the truth." He also expressed the general public sentiment at the time the appropriation was passed by saying: "I hope, when the wreck shall be removed, that it may be done so that the wrecked forebody of the ship may be exposed beforehand, by using a cofferdam, and a judgment thus be formed beyond a doubt as to the accuracy of the board's report. No one connected with the work has any doubt, but it is another thing to convince the world at large."

This is the spirit in which the work has been undertaken and method used will preserve the evidence. It is known already that the forward powder magazines exploded, but whether there was an explosion of a mine first is yet to be settled. The sides and deck of the vessel were blown out and it was cut almost in two about one-third from its bow. The bow remained connected only by the double plating on the bottom and, after doubling over, was the first part to sink. The rest of the vessel sank later intact. It remains sunk in soft mud. The important thing will be to uncover the whole vessel in as near the present condition as possible.

Army engineers, realizing that the mere raising of the vessel will not be adequate, have devised a scheme by which the vessel is to be entirely surrounded by cofferdams and the water pumped dry about the vessel. The mud can then be excavated and the bodies of the dead sailors removed, when the true cause of the disaster can be determined beyond further doubt.

The cofferdams will begin near the bow of the vessel and be made of cylindrical caissons, formed of interlocking steel sheet piling, which will be driven through the mud into the hard clay 70 feet deep. When the cofferdam walls are completed they will be filled with clay and made water tight as well as strong enough to resist the force of the surrounding water when the water inside is pumped out. There will be practically no seepage from below as the cofferdam will be sunk as deep as possible. The cofferdams in themselves would not be able to resist the outside pressure, but the walls will be. Centrifugal pumps will remove the water on the inside as well as a large portion of the mud. Col. Wm. M. Black, of the engineer corps of the army, will have charge of the work. He estimates that the building of the cofferdams and walls will cost \$225,000 of the \$300,000 now available.

MALARIA—MALAY STATES

One hundred men are engaged on the work necessary to the raising of the battered bulk of the *Maine*. The space inclosed by the caissons which are sunk around the wreck are about three square acres. The *Maine* was 423 feet long and 57 feet beam, and the centre of the caissons are 70 feet from the hull. There are twenty-two caissons—six, 50 feet in diameter, on each side, and five, 110 feet in diameter, at the bow and five at the stern. This leaves 45 feet between the inside of the line of caissons and the hull, all around. The figure described by the line is a large oval, 494 feet long and 247 feet wide. The caissons are sunk 12 inches apart, the interval is filled in with interlocking steel piling. The caissons are filled with mud pumped from around the wreck. They work like a row of monster barrels round the wreck. The caissons rise five feet above the surface of the water. There is 35 feet of water where the *Maine* lies, and 17 feet of mud or harbor deposit. The piling is driven 18 feet into the clay bottom. There are to be about 3,300 piles. Near the wreck a structure on piling is used as a power house which furnishes the current for innumerable lights, which transform night into day for the workmen. It is estimated that the caissons will be completed and the pumping out of the water and mud done by the last of Jan. 1911. The engineers, it is said have been instructed to have everything in readiness for memorial exercises on 15 February, the 13th anniversary of the destruction of the *Maine*, by which time it is expected the cause of the explosion will be known. The American colony of Havana are to make a great event of the memorial exercises. Each year the Americans there have visited the wreck and decorated it with wreaths and offered prayer for the men who were swept to death on that memorable February night.

Malaria. Until a few years ago, malaria was considered an indefinable disease, closely akin to fever, whose origin was unknown, but which generally originated, it was believed, in the poisonous exhalations given off by damp and marshy ground, that is, a sort of miasma or effluvium, which the patient inhaled, and which was the direct cause of his disease. Speculations were advanced as to the nature of this remarkable "gas," and innumerable chemical tests were made of the air in the neighborhood of marshy ground, in the hope of isolating it; but all in vain. It was only with the discovery of the cause of this disease that a belief in the existence of such a miasma was given up. We now know that malaria is caused, not by a mysterious effluvium, arising from the swamp; but is the direct result of the bite of a mosquito, it is inoculated, as it were, and the various symptoms we observe are the manifestations of the presence, within the bloodstream, of this poison. By numerous experiments, it has been definitely ascertained that the disease is carried from one person to another by means of mosquitoes, and in no other way; and, further, that only one kind of mosquito, the *anopheles*, does carry the disease in this manner; it can extract the poison from the veins of one already sick with the disease, and inoculate a healthy person with the virus. In this way the disease is spread. The method of stamping out the disease is thus apparent: exterminate the mosquitoes. This once done,

the means of transmission would be abolished, and malaria would cease.

Carrying this idea into practice, much valuable work has been done in the extermination of mosquitoes and their eggs, in marshy grounds, in all parts of the country. Steps have been taken to render their growth and propagation impossible,—with such success that, at the present time, many districts formerly considered most unhealthy, are quite habitable, and, whereas only a few years ago, thousands of men perished annually, not a single death occurs in these districts, due to this cause. The progress made against malaria is one of the most important achievements of modern medical science, and is a good example of the old saying that it is always comparatively easy to cure a disease, when once its true causes are known. That "prevention is better than cure" has been illustrated in a striking manner in the recent progressive conquest of malaria.

Malay States, Federated. A federation of small native States in the Malay Peninsula, which in 1896 came under the administration of a British Resident General and the High Commissioner of Singapore.

The present area and population of the States is as follows:

State.	Area Sq. Miles	Population.
Perak	7,080	335,000
Selangor	3,200	180,000
Negri Sembilan	2,600	100,000
Pahang	14,000	90,000
Trengganu	4,500	120,000
Total	31,380	825,000

The principal products are: cocoanuts, rice, rubber, sugar, tapioca, coffee, pepper, gambier, and nipah palms. About 200,000 acres are planted with rubber trees. Some gold, tin and other metals are found. Yearly exports, \$35,000,000 to \$40,000,000, of which nearly \$4,000,000 is in rubber. The imports (over \$30,000,000) are chiefly rice, petroleum, opium, bran, flour, and sugar. The revenue for 1909 was over \$13,000,000 which was somewhat lower than the expenditure. In Perak, Selangor, and Negri Sembilan there are both English and Malay schools, with over 20,000 enrolled pupils. There are about 500 miles of railways in operation. The principal mining centres are thus connected with sea and river ports. The largest town in the States is Kulla Lampor (Selanger), with about 50,000 inhabitants.

The history of these States has been similar to that of many others which have come under the protective influence of Great Britain in the Far East. In 1874, residents and a staff of European officers were appointed for the West coast Malay States of Perak, Selangor, and Sungei Ujong, to aid the native rulers by advice and to exercise certain executive functions. In 1888 the Rajah or Sultan of Pahang on the East Coast, put his State also under British protection. Meanwhile, in 1883, the interests of the small States on the frontier of Malacca were consolidated with those of the Straits Settlements, and the former were confederated (1889) under the name of Negri Sembilan (Signifying Nine States) and this was placed under the resident of Sungei Ujong, and later, the two being amalgamated, the new federation retained the name of Negri Sembilan.

MALICIOUS ANIMAL MAGNETISM — MALTA

lan. The next step in consolidation was the British Treaty of 1896 with Perak, Selangor, Pahang and Negri Sembilan, forming the Federated Malay States, by which Great Britain came into force, the States agreeing to furnish a contingent of troops for service in the colony in case of war. In 1909 Siam by treaty transferred to Great Britain, the rights of suzerainty, administration, protection, and control over a tract of territory lying north of the Federated Malay States and comprising the whole of Trengganu, the greater part of Kelantan and Keda, and some other districts. The State of Trengganu, which had never acknowledged Siam's suzerainty, joined the Federated Malay States on 18 Feb. 1910.

Malicious Animal Magnetism. In the fall of 1909 the Christian Science Church was thrown into great excitement and the entire country aroused in curiosity over the charges brought against Mrs. Augusta E. Stetson, first reader of the First Church of Christ, Scientist, New York City, and one of the most prominent Christian Scientist "practitioners" in the United States. The charges preferred by the representatives of Mrs. Mary Baker G. Eddy, head and founder of the Christian Science faith, accused Mrs. Stetson of practising and aiding others to practice malicious animal magnetism by wilfully sending "fear thoughts" and "death thoughts" to people against whom she had some grudge. The persons against whom this mental malpractice was supposed to be directed suffered horrible visions, were assailed by all sorts of painful maladies, and in some instances were actually said to have suffered death. Mrs. Stetson vigorously denied having had recourse to any such method of retaliation for personal animosities, but her denial was not credited, and she, together with all those who upheld her and openly vowed allegiance to her, were excommunicated from the Church. But the subject did not end with that. Scientists all over the world were greatly interested in the charges and the manifestations of Mrs. Stetson's "mental malpractice." The question, is it possible to bring suffering, disease, and even death to any person through the medium of thought waves? was interestingly debated on all sides. Opinions as to this varied. Prof. Joseph Jastrow, professor of psychology in the University of Wisconsin, Prof. Hugo Munsterberg, and many other authorities held that it was not a possibility. They declared that the matter was nothing more than a return to witchcraft delusions, and was successful—which they in some instances doubted—solely because the person toward whom the "adverse thoughts" were directed was laboring under a fear derived from his own superstition. At the same time there were many strange manifestations discernible which left the matter somewhat in doubt.

The tenets of the Christian Science Church assert that disease and all manner of evil may be overcome by firmly holding to the belief that they do not exist. This is, of course, purely a mental method of healing. When the conditions are reversed—that is, when the belief is maintained that a perfectly well individual is suffering from a mental or physical ailment—it was held to be the opposite manifestation of this system, or what has come to be called "malicious animal magnetism"—popu-

larly known as "M A M." Mrs. Eddy was herself the first to coin this phrase. From the beginning of her religious work she has believed firmly in its existence. She has stated that her husband's death was caused by it and has been apparently under constant fear that she, too, might become the victim of such malpractice. Richard Kennedy, the first "practitioner" who actively associated himself with Mrs. Eddy in her Christian Science healing work, was finally accused of its practice by her, and subsequently she has brought the same charge against many others. The subject is given prominent mention in her writings, and all are warned against its manifestations. Never before, however, has the subject been brought into such prominence as in the case of Mrs. Stetson. Many of those who follow Mrs. Eddy in her religious leadership are firm believers in the existence of M A M.

By scientists, however, it has been compared to the ideas underlying alchemy and old wives' charms against evil and for invoking evil on others. In order to have it really affect one, they say, it is first necessary that the victim believe firmly in its power. The knowledge that such a practice may be resorted to must stand to him as a vague menace in the background of his mentality in order to have him at all liable to real harm from it. Even then, the authorities who have given thought to the question are not so sure that any actual harm could be wrought unless the subject's own mind first conjures up the form for himself. But they regard it as a very serious condition if there be any—as the events of 1909 show beyond all doubt there are—who actually think they are living under the sway of such a pernicious influence as malicious animal magnetism. There seems to be a growing tendency among believers in the Christian Science faith, however, to sidetrack the issue and deny the existence of such an influence.

Malleable Glass. American glass makers since the beginning of the industry, have endeavored to produce a glass that would have all the clearness and beauty of ordinary glass and at the same time possess a toughness which would render it as little liable to fracture as many of the other manufactured articles of use and beauty. It was well-known that the ancients had discovered and made use of a process of making malleable glass. But its manufacture remained a lost art until 1903 when Mr. Louis Kauffeld, of Matthews, Ind., after many years of endeavor succeeded in producing a glass which will withstand extremely rough usage without breaking. The secret lies principally in the chemicals which are used and in the proportion of ingredients which form the compound, although the furnaces and crucibles play an important part in the process.

Malta. A British island in the Mediterranean Sea, about 180 miles from the African coast.

Area and Population.—The area is 91 square miles; the dependent Island of Gozo included, about 116 square miles. In 1909 the population was approximately 212,900. Valetta is the principal town; its inhabitants in 1901 numbered 30,750. Malta is the port of call in the Mediterranean, and one of the best in the world; it is the headquarters of the Mediterranean fleet.

MANCHURIA — MANCHURIAN RAILWAY CONTROVERSY

History and Government—British occupation of Malta dates from about the year 1800. Prior to that date, and far back into the dark ages, the Island was the scene of many conflicts between Christians and Turks. At the head of the administration stands a Governor, usually a military officer of note. There are an Executive Council and a Government Council, of the latter of which the Governor is President. There are in the Legislative Council a Vice-President, the Lieutenant-Governor and Chief Secretary, nine official members; and eight elected. The Executive Council consists of 13 members, two being unofficial, and the Governor is president of the body. The receipts of the Government in 1909-10 aggregated about \$2,146,450, and the expenditure, \$2,232,800. The military expenditure for 1909-10 was \$1,504,000. The 1908-09 revenue was derived chiefly from customs (\$1,269,500), rents (\$233,500), postage (\$92,000), interest (\$157,000), and licenses (\$39,000). The public debt outstanding in 1909 was about \$385,650. The banks in the country are not under government supervision. Bank notes circulating are those of the Anglo-Maltese Bank and the Bank of Malta (Italian).

Public Instruction, Justice, and Religion—The government education-aid amounts to about \$202,000, and is distributed among 99 elementary schools, two secondary schools, 38 night schools, and a University. Private schools, unaided, number about 120, and there are some garrison schools. The total enrollment of the public schools in 1908-09 was about 22,000. Italian is the official language of Malta, but English is widely used, and the most popular in the schools. Summary convictions in the courts in 1908-09 numbered about 20,950; 6,000 individuals were incarcerated. The Roman Catholic religion predominates.

Industries and Commerce—As a result of the Island's importance as a shipping centre, the majority of the inhabitants are engaged in the shipping industry. Agriculture, however, is attended to, there being more than 41,000 acres under cultivation in 1909-10. Some of the main products are corn, oranges, melons, grapes, forage, cummin seed, onions, potatoes, figs, and honey. Stock-raising has its place in the country's industries. In 1908-09 there were 10,600 horses and donkeys; 7,100 cattle; 17,500 sheep; and 20,800 goats. There are cotton manufactures. The imports in 1909-10 were valued at \$5,713,850, and the exports at \$551,500. There are numerous import duties.

Shipping and Communications—Valetta has one of the best harbors in the world. There were 105 steamers and sailing vessels belonging to that port in 1909. Vessels entered and cleared at the ports for 1908-09, about 3,200, of approximately 4,030,000 tons. Postal service is very active. In 1908-09 letters and postcards received numbered 2,036,700; dispatched, 2,025,675. Newspapers and parcels received and dispatched, 1,444,150. There are about eight miles of railroad in Malta; and about 750 miles of telephone wire.

Manchuria. A vast territory principally under Chinese rule, extending east and west between Korea and the Hingan mountains, and with an area of about 363,600 square miles. The population is probably about 16,000,000;

estimates vary widely. Mukden is the capital, with 158,000 inhabitants. A few of the other important cities are. Newchwang, 50,000, on the Lao river, Tungchiangtzu, 7,300; Fakumen, 19,450; Kwangchengtze, 80,000, Tsitsihar, 30,000, and a great many others with large populations where the trade of the country passes. Since the Treaty of Portsmouth which closed the Russo-Japanese War, 1905, the administration of Manchuria has been exclusively in the hands of the Chinese Government—except in the Liao-Tung Peninsula, where the rights that were originally Russia's have been transferred to Japan. Japan also by the treaty controls the railways as far as Kwanchengtze, and is privileged to build a railway from Antung to the Manchurian capital. China has had to open 16 Manchurian ports to foreign trade, as a treaty-concession, since 1905. The railways of Manchuria extend from the frontier of Chihli northward to Mukden and round the Liao-Tung gulf to Port Arthur. The construction of railroads is rapidly progressing, one line 630 miles long being surveyed in 1910. The importance of Manchuria rests to a great extent in its geographical position in the Orient. It is estimated that the area under cultivation is 4,350,000 acres. The products are those common to the temperate zone. The leading mineral resource of the country is coal, which is found in all three provinces of Manchuria, viz: Sheng-King, Kirin, and Helungkiang. A lively trade is carried on with the Japanese Empire.

Manchurian Railway Controversy. This controversy revolves around the open door in Manchuria and the retention of control of that country by the Chinese Empire. There is no disposition at the present time to dispute the control of the railway system by Russia and Japan, except in so far as the roads seek to discriminate against the commerce of other nations in Manchuria and the Japanese and Russians attempt to administer the territory in their respective zones. The latter event would of course end all Chinese sovereignty over Manchuria. This demand for equal opportunities in Manchuria and for the maintenance of the power of the Chinese Empire there are the big international questions of the day. United States, Great Britain, Germany, and France cannot afford to have such an outlet for their trade as Manchuria closed to them. This viewpoint has been impressed upon Russia and Japan. There is no doubt that they will have to give way before the demands of the other nations. The only question is when and how? Secretary Knox entered the situation in the Far East early in 1910 with a proposal to Russia, Japan, Great Britain, Germany, and France for the neutralization of the Manchurian railways now controlled by Russia and Japan. His idea was that both countries should dispose of their interests to China and that the latter should raise the money for the purchase of the roads by a loan from a great International syndicate to be composed of capitalists from practically all the important powers in the world. This move of Secretary Knox tended to secure for the United States the same influence over Chinese internal affairs as that of Japan, Russia, and Great Britain. As generally known, railroads in China are constructed with foreign capital. There is an imperial guarantee given, always secured either by a first mortgage on

MANCHURIAN RAILWAY CONTROVERSY — MANITOBA

the road or by the pledge of part of China's internal revenue. Such a pledge of course gives to its holder a right to interfere in the internal affairs of the Empire and to ask for administrative reforms. Secretary Knox was anxious that the United States be placed upon that footing in the Far East. If it supplied any of the capital, it would have been. This neutralization proposal made a sensation. Both Russia and Great Britain were in favor of its adoption at the outset. Germany and France felt the same way. Opposition however came from Japan and that sufficed to veto the scheme. A short time after, Secretary Knox made another proposal. It was that a new railway be built by American and British capital from Chingchow, up through Mongolia and Manchuria in a northeasterly direction to Aigun on the Amur River. The American capital for this road was to be supplied by J. P. Morgan & Company; Kuhn, Loeb & Company; the First National Bank and various interests controlled by the Standard Oil. Both Russia and Japan rejected this second proposal. The former urged that China had promised 12 years before that no railways should be constructed north of Peking without Russia being first consulted. Japan alleged a secret agreement with China that no railway shall be constructed in the neighborhood of the South Manchurian line, which Japan controls, or parallel to it or detrimental to it in any way prior to 1938. The railway situation, is therefore hanging fire at the date of this writing. A most important phase is the effort of Russia and Japan to administer the settlements along the route. The Russians base their claim upon an alleged clause in the franchise for the Chinese Eastern railway by China to the Russo-Chinese bank. The validity of this clause is questioned. The Russo-Chinese Bank is a private corporation under joint ownership of Chinese and Russian capitalists. Japan makes her claim on the same grounds as Russia. The original grant made by China to the Russo-Chinese Bank of the franchise for the Chinese Eastern railway covers the line from Harbin to Port Arthur or Dalny. Under Article 6 of the Portsmouth treaty, Russia assigned to Japan that portion of the road between Kwang-Cheng Tse and Port Arthur, including all its branches, and retained for herself the remaining portion from Kwang-Cheng-Tse to Harbin. The claim of Japan is therefore based as original inheritor of the original grantee. If the Russian and Japanese claims to administer the settlements along the route were allowed, this would place these nations in control of the most populous sections of Manchuria. Their zones cover a strip of land running from north to south that cuts Manchuria in half. This strip includes some of the most important cities. A few of them are Harbin, Mukden, Dalny, and Kwang-Cheng-Tse, and over the entire strip of which China is owner it can exercise little or no authority. It is provided in Article 7 of the Portsmouth treaty that Russia and Japan engage to exploit their respective railways in Manchuria exclusively for commercial and industrial purposes and in no wise for strategic purposes. But the conduct of both has not been in accord with this article. Russia in the face of it attempted to administer Harbin. This brought on a conflict with the United

States, which led to an agreement between Russia and China providing a method of government for the Russian railroad zone, based on the guarantee of Chinese sovereignty and the principle of joint administration. Japan has a system of rebates on her road, which tends to help the Japanese merchant, but discriminates unfairly against the American. The rebates run from 1 to 7 per cent to shippers whose freight bills amount to sums ranging from \$50,000 to \$250,000 a year. The American merchants claim that the Japanese by pooling shipments get the 7 per cent rebate while the highest any American gets is 1 per cent. Japanese merchants are also allowed to take their goods into Manchuria without paying the proscribed import or other duties. The South Manchurian Railway is one of the few tangible assets Japan acquired as a result of the war with Russia. The main line runs from Dairen (Old Dalny) to Changchun, a distance of 438 miles. There are branch lines to Port Arthur, which is 32 miles, to Yingkon or New-Chwang, 13 miles, and to Chien-Chin-Chai, 31 miles. To this system is also added the Antung-Mukden line of narrow gauge, constructed by the Japanese army during 1905 for military purposes. The total mileage is 703. A right and privilege obtained by Japan in connection with the road is that of exploiting the coal mines of Fushun and Yentai. It has been estimated that the resources of the Fushun coal fields is 800,000,000 tons. The present daily output is about 2,000. The Japanese Government is preparing to increase it to 6,000. The trade between Europe and the Far East is the most important factor of the Manchurian railway system. It is not possible to run the roads on a profitable basis without the trans-Siberian traffic. The railroad situation in this respect is a three-cornered affair, Russia holding the line in the north, running as far south as Kwang-Cheng-Tse, Japan the line from Kwang-Cheng-Tse to Dalny, and China the line from Mukden to Peking. Russia holds the connecting link, but has no outlet for Vladivostok, which is a harbor closed to traffic during the greater part of the year. Russia must combine therefore with Japan, using Dalny as the destination and the outlet to the sea or with China, using the Chinese line to send her goods by the way of Peking-Hankow Railroad, which would spread them all over China. For Hankow is the distributing centre of the kingdom.

Manitoba. A province of Canada, formerly the Red River Settlement, with 64,327 square miles of land area and 9,405 square miles of water area. The population is about 450,000. The seat of government is Winnipeg, with a population, in 1909, of 130,000. The Lieutenant-Governor is Sir Daniel Hunter McMillan, with a salary of \$9,000. The Lieutenant-Governor is appointed by the Governor-General and acts through the Provincial Executive. The legislature consists of one chamber, of 41 members, elected every four years. Rodmon P. Robbin is the President of the Council. In 1869 the extensive region, known as the Northwest Territories, was added to the Dominion by purchase from the Hudson Bay Company; the province of Manitoba was set apart out of a portion of it, and admitted into the Confederation on 15 July 1870. Manitoba sends 4 members to the Senate, and 10 to the House of

Commons Manitoba, like every other province of Canada, has full powers to regulate its own affairs and dispose of its revenues, provided it does not interfere with the action and policy of the central administration. Manitoba has a university and several colleges besides 2,000 public schools. About 5,000,000 acres are cultivated, of which about 2,650,000 acres are under wheat. The largest crops are of wheat and oats, and the lesser of barley, flax, rye, and peas. The main lines of the Canadian Pacific, the Canadian Northern, and the Grand Trunk Pacific railroads traverse Manitoba, and there are several other lines in operation. The Red and Assiniboine rivers are also navigable for a considerable course in the province. The telephone systems and grain elevators have been acquired by the Government. See CANADA.

Mann, Cameron, third missionary P. E. bishop of North Dakota and 201st in succession in the American episcopate: b. New York City 3 April 1851. He was graduated from Hobart College A. B., 1870, A. M., 1874, and from the General Theological Seminary, New York City, in 1873. He was ordered deacon in 1873, was missionary in charge at Branchport, N. Y., and curate at St. Peter's, Albany, N. Y., 1873-75, was ordained priest in 1876 and was rector of St. James, Watkins, N. Y., 1875-82; and of Grace Church, Kansas City, Mo., 1882-1901. The honorary degree of S. T. D. was conferred on him by Hobart in 1888 and by the General Theological Seminary in 1902. He is the author of many sermons, discourses and pamphlets and of several poems. In 1901 he was elected third bishop of the missionary district of North Dakota as successor to the Rt. Rev. Samuel C. Edsall, D. D., who had been translated to the diocese of Minnesota, and he was consecrated 4 Dec. 1901, his consecrators being Bishops Tuttle, Talbot, and Atwill.

Manson, Sir Patrick, English physician and medical adviser to the Colonial Office: b. 3 Oct. 1844. He became distinguished as a parasitologist, and was the first to enunciate the hypothesis, since proved correct by Major Ronald Ross, that the mosquito was the host of the malarial parasite at one stage of its existence and thus an active agent in diffusing the disease. He was created a companion of St. Michael and St. George in 1900, and Knight commander of St. Michael and St. George in 1903, and was a fellow of the Royal Society; and a fellow of the Royal College of Physicians, of London. The honorary degree of D. Sc. was conferred on him by Oxford University. He is the author of 'Goulstonian Lectures' (1896), 'Tropical Diseases' (1907) and various scientific papers. He retired in 1910.

Manufactures, United States Bureau of. The bureau was organized in 1910 and resumed the daily publication of the editorial reports from American consuls abroad. For some time the consuls have been looking into foreign fields as a market for American autos. Vice-Consul Woodward at Dawson, Yukon Territory, wrote in 1910 that there were two automobiles used in Dawson and vicinity, although only a few years ago it was generally conceded that it was impossible to use an automobile in the Klondike. An experienced chauffeur stated to the consul that he found the roads in better condition than around some more settled com-

munities, and that the freight rate for automobiles to Dawson by the White Pass and Yukon route was only \$190 a ton. Consul Ingram, at Bradford, England, wrote that the demand for automobiles in that country was constantly on the increase and that notwithstanding the comparatively small area of Great Britain the number of motor cars in use was very large. A motor journal gave the number of automobiles registered in the United Kingdom in 1910 as 203,227. The American automobile makers were not getting their share of the business, according to the consul. There was, he said, a prejudice against American productions to be overcome but that could be accomplished by time and patience. Whereas formerly large numbers of cars were imported into Great Britain from several of the continental countries, returns showed that the number was gradually decreasing with a corresponding increase in those made in England. Consul Burdel, at Rheims, France, said that a great percentage of all automobiles registered in France were of French origin, although there were a few of American make. There was a good demand for 10, 12, and 14 horse power and four cylinder cars, selling at \$800 to \$1,200 and a good market was promised for good American cars of the above description and prices.

Maple Sugar. See SUGAR, MAPLE.

Map of the World. See MAPS.

Maps. "The International Millionth Map of the World," which has been advocated for the last 18 years as a highly desirable geographical and topographical guide, having all lands mapped to the same metrical scale, is now in process of preparation in various countries. Prof. Albrecht Penck, in 1891, while professor of geography at the University of Vienna, first proposed a standard atlas of the world at the International Geographical Congress at Bern. He pointed out that maps of different countries, both large and small, are drawn to different scales. Colorado, for example, with 103,925 square miles, now fills a page, just as Wisconsin does with 56,040 square miles, or as Massachusetts, Connecticut, and Rhode Island together do with their 14,555 square miles. So in Massachusetts, two towns with an inch between them on the map, would be 12 miles apart; but in Colorado two towns with one inch between them on the map would be 29 miles apart. This old method caused no trouble except that the page had to be filled, and the different countries of whatever size had to be separately mapped. Often it appears that a State is as large as the whole of the United States. If one wants to know the comparative size of countries (France, for instance, is about four-fifths as large as Texas) it cannot be ascertained without remeasurement by scale. The need of the map is greatest concerning the countries which have been least adequately mapped, including both the Americas, Africa, Asia, and Australia.

The International Millionth Map as proposed by Professor Penck is to be drawn to a scale of 1 to 1,000,000. That is, any length measured upon the map is to be one-millionth part of the distance between the same two points measured on the ground. A meter on the map is thus equal to 1,000,000 meters or 100 kilometers

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on the ground. This will be about 16 miles to the inch,—which is a scale large enough to allow the engraver to delineate villages, cities, railroads, roadways, the larger water courses, and the general features of hills and mountains. It shows all essential features, and a single sheet can be conveniently handled on a day's journey. The motorist especially will be the gainer. For some years past the United States Geological Survey has had maps in preparation with the design of publishing them on the one-millionth scale; but has awaited the international agreement before pushing them to publication.

The Bern Congress of 1891 favored the plan and appointed a committee to consider it and report at the next Congress. Mr. Neudenhall, superintendent of the Coast and Geodetic Survey, and Major Powell, director of the Geological Survey, represented the United States. A sub-committee, acting in an advisory capacity, at the head of which was Edward Bruckner, then professor of geography at the University of Bern, was active in developing the subject. Professor Bruckner's report at the Sixth International Geographical Congress at London, in 1895, presented the principal items on which agreement was necessary. Attached to his report were 22 articles published between 1901 and 1905. Mr. Bailey Willis, of the United States Geological Survey, has recently made a notable contribution on the subject in *The National Geographic Magazine*.

Meanwhile, in 1899, at the Geographical Congress in Berlin, Professor Penck had presented his plan, but national differences then seemed insuperable. The English geographers refused to accept the metric system; and the French insisted on the meridian of Paris as the initial meridian of the international map. In 1904, at the Eighth Congress, held in Washington, Professor Penck took advantage of the fact that France, Germany, and Great Britain had separately prepared maps, on a scale of 1 to 1,000,000 of countries as far apart as China, India, Persia, Africa, and the Antilles, to congratulate the assembly on the progress made toward the world map. And he pointed out that there was no general map of North or South America, or even of the United States, such as any student or traveller requires, and he urged the Geographical Congress to induce the United States to do for America what Great Britain is doing for Africa; that is, to prepare a uniform map of both the American continents on a scale of 1 to 1,000,000. This bore fruit in the work of the Geological Survey. A number of maps were prepared by Mr. Henry Gannett, to become part of the one-millionth map of the United States, though not adjusted to any general plan of the map of the world. The units chosen were States, and the drawings were made in accordance with the methods of cartography which have become familiar through the atlas sheets of the Geological Survey.

At the Ninth International Geographical Congress, held at Geneva in July 1908, Mr. Gannett presented resolutions through the American delegate urging agreement upon essential details and that such agreement be referred to the several map-making powers with a request for an international conference having authority to act upon them. The resolu-

tions were passed, a committee was appointed, and the details of a plan were worked out and adopted. Then, in 1909, the British government issued invitations to Austria-Hungary, France, Germany, Italy, Japan, Russia, Spain, and the United States to send delegates to a conference to assemble in London on 16 November. With all the preliminary discussion previously held, this conference took up every proposal and debated it in English, French, and German. The initial meridian of Greenwich was adopted unanimously, without debate. The metric system was agreed to by the English and American delegates, with the provision that the scale of distances might also be stated in terms of miles or of any other unit (such as Russian versts) of the country producing a part of the map. The metric scale was accepted for altitudes above sea, with the proviso that the height in feet may be given in parentheses after the number in meters. The conventional symbols to be used for representing water-courses, roads, railroads, towns, cities, and the names of various features were agreed to in detail after thorough discussion. Thus it will be seen that the result embodies practically all the conventional features used in the maps of the United States Geological Survey.

The Latin alphabet alone may be used in the spelling of names on official maps. For example, Florence will be Firenze, Rome, Roma; Flushing, Vlissingen, and Vienna, Wien. The Turkish name, Stamboul, will not be used. For China the adopted spelling was to be that of the post and customs service.

A difficult question was how to delineate mountains, hills, and valleys. Hachures, contours, and relief shading, or combinations of all three methods characterize modern topographic maps, and one of the most difficult questions before the conference was to harmonize the various methods in current use. A high degree of graphic expression has been attained in maps prepared by the United States Geological Survey where only contour lines are used for delineating mountains. The London conference in the main adopted generalized contours as the method of representing topographic relief, to be drawn so as not to unduly obscure other features of the map, and, in addition, shading will bring out those minor features which cannot be adequately represented by contours. To show altitudes, the conference adopted a scale of colors, to be printed on different portions of the map, according to the height above sea level. The depths of seas and lakes will be shown by shades of blue; the lower lands, from the coast to 300 meters (984 feet), by three tints of green, shading into pale buff, which at 500 meters passes into light browns, that grow darker up to 3,000 meters. Above 3,000 meters the brown tints tone into rose, violet, and fade away to white in the highest summits beyond 7,000 meters.

Thus, summing up its features, the map will represent streams and bodies of water, towns, railroads, and highways, political boundaries, topographical relief, and the names pertaining to all these features. It will be a base map capable of receiving additional data which will convert it to special purposes. For example, density of population might be shown by overprinting in different shades of color; or the crops, the weather, and the geological condi-

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tions of a locality; or the relations between lines of transportation, or works of internal improvement, whether national, State or private

Each sheet of the map measures four degrees of latitude by six degrees of longitude. In the discussions of the conference the execution of the circular sheet covering the northern polar regions within the parallel of 88 degrees was courteously committed to the United States. The number of sheets necessary to represent the entire world is 2,642. Since three-fourths of the earth's surface is water, however, the atlas will probably never have more than 1,500 sheets, including the oceanic islands. The United States, exclusive of Alaska, and including portions of Canada and Mexico, and adjacent oceans, requires 52 maps. The Geological Survey was at work on nine of these at the beginning of 1910. It is expected that the first edition of the one-millionth map of the United States as part of the standard map of the world may be engraved and published within 10 years.

There is perhaps nothing which more strikingly distinguishes new maps from old ones, or maps of one nationality from those of another, than the manner in which valleys, hills and mountains are represented, whether it be by drawing the shapes of mountains, as in Chinese maps, or by covering the paper with short dashes, sometimes called 'hachures,' which show the way the water runs, or by horizontal lines which delineate the contours of the slopes, or by shading with high light and shadow, as if the map were a relief model. Hachures, contours, or relief shading, or combinations, of two or even of all three methods, characterize the mode in topographic maps, and one of the most difficult questions before the conference was to harmonize the various methods in current use.

In maps prepared by the United States Geological Survey, contour lines alone are used, and the delineation of mountain chains by means of them has been brought to a higher degree of graphic expression than ever before. This is due to the fact that the American topographer regards his work as a profession rather than as a side-issue of military training, which is the position which holds abroad.

Each sheet measures 4° of latitude by 6° of longitude. Thus 60 sheets will belt the earth and 22½ sheets extend from the equator to the pole. Fifty-two of them will be executed by the United States, and a number are now in course of preparation by the Geological Survey, covering parts of the Eastern, Central, and Western States. The originals are being drawn on a scale of one five-hundred-thousandth, or eight miles to the inch, and in such a manner that they may be reproduced by photolithography in a clear and effective manner for publication on a scale of 10 miles to the inch. In this form, the maps may become immediately available for use by the departments of the government or by individual States, and eventually, as Congress provides the means, they will be engraved and published on the scale of 1,000,000 (16 miles to the inch) with all the details required by the decisions of the international conference at London. It is expected that 10 years will be required to complete the maps according to this plan.

Marathon. See SPORTS.

Marianne Islands. See LADRONE ISLANDS.

Marine Farming, an occupation carried on in shallow water in various parts of the earth, gathering and rendering edible ocean growths. As the richest vegetation in the sea is accessible from shore, there still remains a vast area of the earth's surface capable of development and yielding rich returns

The most active of marine farmers are the Japanese, who have taken considerable advantage of salt water plants and compel the sea to yield annually over a million dollars worth of produce. The seaweed porphyra is regarded in certain districts of Japan as one of the food necessities. It is farmed as regular business and brings returns commensurate with the farming on shore. It is confined to no one portion of the country, but is familiar to most Japanese. Twigs in tight clumps, or small shrubs with many branches are planted in long rows in shallow and brackish water, with only sufficient space between to accommodate canoes. On these twigs the delicate growths gather which constitute the object of this peculiar husbandry.

The harvest comes late in the winter. At that time delicate marine plants attach themselves to the twigs and grow into sheets, not unlike leaves, and of a purplish color. Their growth, largely free from the twigs, make the harvesting a comparatively simple matter, and girls in canoes, passing down the rows, pluck them off and, after washing the mud away lay them on reed mats in the sun to dry. While still wet they adhere on account of the glutinous quality of gelatine they possess, and, when peeled off the mats, remain in large sheets, which are folded and packed for market. The favorite method of preparing them for food is baking.

Somewhat similar plants grow thickly along the Atlantic Coast and in the Gulf of Mexico, but, as yet, very limited use has been made of them. The same glutinous quality possessed by the Japanese porphyra would make them a valuable addition to the American table, and, in fact, has already done so to a small extent. The sea moss gathered on Cape Cod is made into preparations that are used in the manufacture of desserts, and cooks find them especially valuable in blanc mange. This is similar to Irish Moss, which has been used for many generations.

The only extensive use of sea weeds for food in this country is found in Philadelphia, where a sea spinach, a form of sea-weed, "laver," is a local delicacy. It is cooked like ordinary spinach. "Dulse," which is eaten in most parts of Europe and finds a certain sale in this country, is also a sea-weed. Other forms of vegetation have as yet hardly been tried, although scientific investigation has pronounced them edible and containing highly nutritious substances.

While the whole sea, except in the greatest depths, is filled with life even more varied than the life ashore, the nearer the surface the more luxuriant it is. Sounding the great chasms and wide valleys of the sea's lower depths shows that it is largely covered with the remnants of life which prevails nearer the surface. These are largely silicious shells of organisms so minute that the shells form into a mud. Wherever the sea's floor has been

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examined below a depth of 26,000 feet this same mud has been discovered. How widely spread these countless fragments of extinct life extend has not been determined, as the greatest depths have not yet been fully examined. The Tuscarora basin in the Pacific Ocean to the eastward of Japan is apparently carpeted with this mud and specimens of it have also been found in the depressions immediately north of the island of St. Thomas (23,235 feet), south of Nahe Island in the Aleutian chain (24,311 feet) south of the Marianne Islands (27,502 feet), east of the Urup Island in the Kurile group (27,946 feet) and in all the other holes which mark the ocean bed.

These microscopic plants from which these shells come grow only in comparatively shallow water (less than 200 feet), but the shells are found intact even at a depth of 10,000 feet. Beyond that the fragments only penetrate, but in sufficient numbers to constitute the chief substance in the greatest depths. The shells are so microscopic that they can not be seen distinctly except under strong glasses, which magnify them to many times their real size, but by the use of a powerful lens they are found to be of untold variety and form and even under the strongest microscopes indicate a diversity of design of remarkably beautiful forms even more minute than the glass is able to make distinguishable.

These microscopic plants are known as diatoms and belong to the class of algæ. In the North Sea and along the coast of Northern Germany there is a form named *Plicurosigma angulatum*. It has a long shell and is covered with hexagonal depressions scarcely perceptible under ordinarily powerful microscopes. In the Gulf of Mexico, a similar form is very common at 100 feet. In detail, however, it is radically different, resembling more a third variety, found at 150 feet in the Bay of Naples. It has a flat oval shell and is thickly studded with minute prominences, placed with marvelous regularity. The Naples variety is known as *Orthoncus splendida*, and the Mexican *Navicula prætecta*.

A California species, *Isthmia nervosa*, is in two parts, one fitting into the other. And, to the north, extending as far out as the Hawaiian Islands another diatom occurs which has a disc-shaped shell covered with tracery resembling a spider's web. The shells are fastened together in a remarkable manner, having a cylindrical band over the edges of which the shells fit. In other parts of the world shells are found with tracery as varied and beautiful as the designs made by frost on the window pane.

These minute growths have constituted a portion of the food of human beings for hundreds of years but has passed as a variety of earth until examined under the microscope. The natives of Liberia, Northern Africa, in several parts of South America, and in the West Indies have used this "earth" with their meal and made it into bread. In Sweden and Lapland a similar custom prevails. The diatom shells forming what has long been known as "mountain meal" "Infusorial earth" is nothing more than diatom shells. Tripoli and marl are other names for forms in which the collections of diatom shells are found. They lay in beds often 150 feet thick and extending over many square miles of territory. This is accounted for, however, in spite of the infinitesimal size of the

shells by the rapid growth, nine million descendants appearing from one diatom within less than a month.

Kieselgur, or "infusorial earth," when mixed with nitro-glycerine, forms dynamite. Guano has also been discovered to be little else than the shells of diatoms which had been swallowed by the birds with their food.

Aside from the uses to which this microscopic growth is put, it has a scientific value of an entirely different kind. The icebergs which float north from the Antarctic Ocean often have layers of brown diatoms. This has led to the belief that the land surrounding the South Pole has for its chief form of life numerous varieties of these microscopic organisms.

Most of the uses made of the products of the sea have been accidental. There are unquestionably also many untested plants and forms of life which would bear cultivation no less than the oyster and the porphyra of Japan.

Seaweed Products—The great masses of uprooted seaweed along our coasts, particularly after a storm, gives it the appearance of a waste product, and, with a few exceptions it is. Seaweed elsewhere, however, serves useful purposes. In many parts of the world it is used as a fertilizer and in some cases is fed to cattle and swine. When dried it is useful for stuffing mattresses and in the upholstering of other articles of furniture. It forms no inconsiderable portion of the dykes of Holland. Experiments are even being made to utilize seaweed as a substitute for wood pulp.

Probably the largest and most important use of sea products is in the manufacture of "kanten," or seaweed isinglass, which is made in Japan and exported to all parts of the world. It is prepared from seaweeds of the genus *Gelidium* which grow on rocky sea bottoms and are uprooted by divers, who work continuously over long stretches of coast from May to October. The divers or the companies engaged in this work dry the weeds and sell them to "kanten" manufacturers at from 6 to 9 cents a pound, depending upon the season.

In the factories the sea weeds are washed, bleached, and boiled, and, after being strained and filtered, the gelatin is separated from the other matter. The process produces bar and slender kanten, which are semi-transparent and a shiny white. In its final form it sells for 25 cents a pound. There are over 500 establishments engaged in its preparation and their annual output is more than 3,000,000 pounds a year.

It has many uses, as it can be utilized wherever gelatin is required and is regarded as better than the animal product. In sizing textiles, stiffening the warp of silk, as well as in clarifying wine and beer, it has international application. The molds used by workers in plaster of Paris are also made of the Japanese gelatine. Under the name agar-agar, bacteriologists make use of it in the culture of bacteriological colonies.

Japan, while the largest exporter, has not an exclusive trade in kanten. In other Asiatic countries it goes by various names, such as Bengal isinglass, agar-agar gum, Ceylon moss, Chinese moss, and agal-agal. The same weed is quite common along the Pacific Coast of America and grows over large areas off the Atlantic coast. The only use that has been made

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of it, however, is in Ventura County, California, where the weed grows so abundantly that it is baled and shipped to China to be manufactured into Chinese moss. Funori, or seaweed glue, sells at prices ranging from 4 to 20 cents a pound. A few of its uses are cementing walls and tiles, glazing fine papers, starch, glazing, and stiffening fabrics.

Kelp, the most common of seaweeds, which is found along the shores of almost every country in the world, contains valuable properties. Iodine is one of the chief, but the nitrate beds of Peru have made its production there so cheap that the profitable production from seaweeds is only possible now by further study of the other products. These, however, have yielded some striking results. Chloride of potash and cellulose are among them, but algin, one of the chief substances of kelp, on experimentation has shown itself capable of diversified utility. As a starch it has 14 times the viscosity of those in ordinary use and 37 times as much as gum arabic. On account of its elasticity and flexibility it serves as a soluble substitute for albumen but can also be rendered insoluble and used as a mordant.

Sodium alginate is recommended as the best available preparation for the preventing of incrustation on boilers. In other combinations it lends itself to various manufactures and arts. Bichrome makes it insoluble and silver aginate darkens quickly upon exposure to the light. Algin, like the gelatin products of other seaweeds, is used for thickening soups, and druggists find it valuable as a substitute for gum arabic in many of their preparations, as well as in emulsifying oils and clarifying spirits.

The most common food prepared from kelp is the Japanese "kombu," which is served as a vegetable in all Japanese families. It is also cooked with fish and meats, is an ingredient of several confections, and is even made into a beverage. It is suggested that this food could be adopted to use in this country.

The kelp, in the Pacific in particular, form enormous forests stretching out many miles to sea which help break the force of the tides that beat upon the American shore. After storms they frequently become dislodged and litter the beach. Of these there are several forms. On the coast of Alaska and among the Aleutian islands grow great patches of seaweed, *Nereocystis luteana*, fastened by a slender stalk which is frequently 300 feet in length. Another similar species, the *Macrocystis*, is even larger, covering area of almost an acre and fastened to the sea bottom only by a stalk which has been found to be as long as 1,500 feet.

Kelp alone, if taken advantage of, would become an important natural resource. Its products, imported from other countries and essential to American manufacturers, cost many thousands of dollars, and its food value has hardly as yet been investigated in this country.

The Hawaiian Islands present an example of the uses to which sea-products can be put. Before the coming of the missionaries the foods of the islands were very limited, consisting, aside from very few fruits, in poi, fish, and the numerous varieties of seaweed, all of which were taken advantage of to vary the monotony of the diet. Seventy distinct varieties were used by them, according to Minnie Reed, who has made an exhaustive report on this subject for the Hawaiian Agricultural Experiment Station,

and of these 70, more than 40 are in common use to-day. They are classed under the general name of limus. The women and children gather the varieties which grow close to shore. At low tide they scrape the limus from the rocks and bring them back in sacks, after washing them free from dirt and sand. Many varieties, however, grow far out on the coral reefs and require strong swimmers and good divers to loosen them. The men do this work, frequently swimming far out from the shore and returning with their sacks filled with limu. Limu gatherers in shallow water sometimes use a glass-bottomed box. This device has been introduced by Italian fishermen and the natives scorn it.

The Hawaiians have acquired much practical knowledge of the seaweeds and know how to handle them to the best advantage. The chief requisite is careful cleaning through many waters and in some cases immediate use. After cleaning the seaweed is salted and is usually broken, pounded, or chopped into small pieces and is eaten uncooked as a relish. A favorite combination is raw fish and limu.

Cooked limu is more common than in ancient times. Hampered for lack of utensils the natives formerly cooked it only when wrapped about an animal and steamed in the primitive way. Cooked in this way the limu became gelatinous and was regarded as a delicacy by the natives. And even now the average Hawaiian's chief diet consists of meat wrapped in limu. The variations are endless, but whatever meal is served by a Hawaiian is certain to contain limu.

As seaweed is only to be gathered in season, it is preserved by salting and laid away among layers of ti leaves. After being pounded it is usually stored in calabashes or vessels containing weak brine.

To increase the supply and guard against periods when seaweed is scarce, a rude cultivation is practiced at one point in a small cove to the northward of Moloaa Bay. The cove is shallow, making the seaweed easy to gather at all seasons. The formation is coral, the favorite haunt of the limu *kohu*, which is highly prized. To give it plenty of opportunity the natives weed out all other varieties of algæ and, in consequence, the limu grows to a size which has made it known to all parts of the islands. It is scheduled on the Honolulu market and the natives of Moloaa make a good income in return for their marine farming.

The Hawaiians have acquired such a strong taste for seaweed that, in spite of their varied native forms, they import largely every year from Japan, consuming various Japanese forms to the extent of 200,000 pounds annually. Chinese merchants also import 80,000 pounds annually for sale among the Hawaiians.

Limus are also used by the Hawaiians as medicines. Some varieties are pounded for poultices and cuts or bruises are always bandaged with pounded limu. Other forms in combination with algæ are used as cathartics. It has also been used for incantations, and limu kalawai is eaten by lovelorn maidens as a love potion, a portion of the same seaweed being served to the object of her affections.

Raw seaweed does not appeal widely as a salad or vegetable except to native races, although the saline taste is not noticeable in some of them, but as a gelatine, in particular, there is an open opportunity for manufacture.

MARINE FIBRES—MARS

The presence of the Japanese has worked a hardship on many Hawaiians, who are unable or unfitted temperamentally to compete with them. By their superior industry they have captured the fishing trade, at which the Hawaiians are highly skilled, and are working the plantations. The natives are hard put at times for a profitable occupation and form the type of cheap labor which would be best fitted to making use of the seaweed possibilities of the islands. The 500 factories of Japan indicate the extent to which the industry might be carried.

After a thorough investigation of the subject of seaweed as applied to the United States the Department of Agriculture points out its value as a manure as of greater importance than any of its other possibilities. It belongs in the same class of manures as barnyard and green manures. It furnishes more or less of all the constituents needed by plants and supplies the soil a large amount of humus which is needed to improve its physical properties. In porous, sandy soils it is especially valuable. It has a higher percentage of potash and a lower percentage of phosphoric acid than barnyard manure. It is not so well balanced as barnyard manure and cannot be used continually without the use of bone or other phosphate.

The excessive amount of potash in seaweed makes it valuable for use on soils which have become deficient on account of the frequent planting of potatoes or clover. At Rye Beach, New Hampshire, seaweed has been used on the land ever since it was settled and clover has become a steady crop.

Seaweed may be applied as a top dressing on grass or be plowed under. It decomposes quickly and releases the nitrogen. The more succulent and mucilaginous varieties of seaweed are mixed with other manures to start fermentation. In applying seaweed to potato fields, some authorities hold that the quality of the tubers is impaired if the manuring is done in the spring, since it permits the escape of large quantities of chlorin in the ground. In New England the farmers invariably apply it in the fall.

One striking advantage of seaweed as a manure is its freedom from weed seeds, eggs of insects, and germs or spores of plant diseases. It cannot be carried far inland on account of its bulk, but the production could be increased to a large extent by taking advantage of the waste seaweed adjacent to seaside farming communities.

Marine Fibres. In Australia was developed during 1910 a textile seaweed which may be utilized exactly as are such land plants as flax, hemp, and jute. This seaweed is of the family of the Naidaceæ, called *Posidonia Australis*. In Spencer Gulf, south of Australia, millions of tons of material of which the fibres of *Posidonia* constitute a great part have been found. Numerous experiments have demonstrated beyond all question that the properties of these fibres may be successfully spun and woven by being mixed with wool, while they will take dye almost as readily as wool itself. This is not true of any other textile of vegetable origin. It, therefore, makes the fibres of *Posidonia* particularly desirable in the manufacture of large carpets or rugs. They are also as good as hemp for calking vessels, and may be of great

value in making bags for the transportation of coffee, wool, or cotton. Another distinct advantage which they possess is an inability to take fire until in a neighborhood of 275° F.

Specimens of different products made from marine fibre were put on sale in Australia during 1910, and met with a good reception from merchants and manufacturers. The first attempts to use the fibres in paper making proved unsuccessful, but the experiments along that line have been continued and ultimate success appears probable.

Numerous recent soundings along Spencer Gulf have showed that the deposits of this textile seaweed have been accumulating for centuries, and is now very extensive. It is found sometimes right under the surface and sometimes deeper down, reaching a thickness which varies from four to twelve feet. The fibres have been entangled by the action of wind and waves in a mass of fine sand, shells, clay, and calcareous matter; they are intimately mingled with all these substances, holding them together like a web. The lower strata are of better quality than the upper, since the latter contain decaying roots of the more recent vegetation. Below a depth of two feet, however, the fibre is of a clear color, while mixed with layers of earth. Specimens of the best quality for industrial use are those which have been obtained in layers covered with two to ten feet of water.

This mass of sand, shells, clay, and lime, mixed with the fibres is so easily worked that the extraction of the textile substance does not appreciably increase its cost as a commercial commodity. Twenty tons of material will furnish one ton of fibres in a fit condition for manufacture, according to a rough estimate. The crude fibre, after imperfect drying on the beach, is sent to a neighboring port on barges. Here it is dried mechanically, sorted according to quality, and finally made up into packages for shipment.

If the use of the objects already manufactured with the *Posidonia* fibres shows, as now seems probable, that durability is one of the valuable qualities of the plant, the industrial and commercial movement which has started at Spencer Gulf is destined to quick extension. Already an attempt is being made to better the conditions governing the extraction of the material. The fibres are to be collected by means of barges provided with special receptacles and rakes, as well as agitators and compresses similar to those used for cleaning wool. Also a company has been formed to exploit the fibre commercially, either in the raw state for a relatively low price, or by the adoption of machinery especially adapted to work it in the best possible conditions. The enormous quantity of raw material at present available, coupled with the success of most of the experiments already attempted, makes this discovery of more than ordinary industrial significance.

Marine Insurance. See INSURANCE, MARINE.

Marion Harland. See TERHUNE, MARY V. H.

Marks, Mrs. L. S. See PRESTON, JOSEPHINE.

Mars, Canals of. The astronomer Schiaparelli in 1877 called attention to a series of dark streaks on the Martian deserts connecting large dark areas, at that time believed to be

MARS — MARTINIQUE

seas Schiaparelli designated these markings as "canals" but did not commit himself as to their exact nature, although there has come to be a popular, rather than astronomical, idea, that these canals were used in some way for the cultivation of the soil of Mars, and the existence of a race of Martians has had its strongest support in the popular mind on account of their presence. This conception has, however, been questioned, as it has been shown that these canals are in no wise regular as if dug by some gigantic system of dredging but are altogether irregular.

The canals were found to be in some cases 4,000 miles long and 200 miles wide. Prof. E. E. Barnard, with the use of the Lick and the Yerkes telescopes could not substantiate the apparent construction of these streaks and classed them as broad, diffuse, scattered bands in no way resembling canals. The first public disillusionment regarding the canals, however, was made by Eugene Antoniadi, at the equatorial telescope at Meudon, the most powerful in the old world, in Sept. 1909. His observations became public in 1910 and he pointed out that, though he had been able to make a much more detailed map of Mars than had ever been made in the past, he was unable to make out a geometrical network of canals. He declared it an optical illusion. Professor Frost of Yerkes Observatory in Chicago arrived at the same conclusion.

The present knowledge of the appearance of Mars indicates the canals are diffuse, irregular streaks, although large numbers of them forming into detached groups gave the appearance of single broad canals to the instrument used by Schiaparelli. The present day telescopes, however, show these streaks in their true character. The remarkable thing about all the markings on Mars is the optical illusion, Sun in the lesser telescopes. As Antoniadi expressed it, "This tendency of the planet's markings to become irregular with an increase of aperture is obvious not only in the 'canals' but also in the so-called 'seas,' several of which showed geometrical forms to the first observers of Mars, for when we examine a group of spots at the limit of visibility and suspending a very small angle our eye will interpret the complicated structure, which it cannot define, in the simplest way, and will show straight lines and curves there where nothing of the kind actually exists on the object under scrutiny.

Mars, it is said, much resembles the moon. Its great deserts are marked with innumerable dark spots, irregular in outline and intensity, and not sufficiently regular to permit of the idea that they were built by an intelligence comparable to that of human beings. However, these streaks have an objective basis which can be photographed, but the effect of these photographs is to show that none of these manifestations are artificial.

In spite of observations which appear to prove the contrary, Professor Lowell, the American astronomer, adheres to the theory, which is based on observations covering many years on the desert at Flagstaff, Ariz., that the canals are regular straight lines, actual canals dug by Martians to supply water to their nearly dried-up planet. He even points out four new canals, recently discovered, which, he says,

are undoubtedly the most recent works of Martian engineers. If they had previously been in existence, he points out, they would long ago have been discovered during the 15 years he has been making observations at Flagstaff. Professor Lowell's conclusions, based on his observations, present a number of points difficult to explain away. It was suggested that Lowell's opponents make observations with him at Flagstaff, but this will not be done.

Svante Arrhenius has advanced a new theory directly opposed to that of Lowell. He finds that the temperature of Mars is too low to permit life of any kind and suggests that the canals are in reality long, deep fissures caused by the sinking of the crust. Formations somewhat similar are shown on the earth, the longest one being 2,200 miles long on the coast of Peru and Chili. The fact that they appear and disappear regularly each year Arrhenius explains by saying that they contain water which accumulates into lakes where the canals meet. Owing to the intense cold, the water freezes and in the dry air evaporates and causes snow about the pole of the winter hemisphere. At the end of the winter he holds that the lakes and canals have lost all their water, leaving nothing but salts. As the snow melts, the water is again precipitated into the canals and lakes.

Critics of Arrhenius point out that there is air and more water than this theory would admit of on Mars. If the temperature were -22°F. , as Arrhenius presupposes, the polar caps would be always covered with snow, while in fact it disappears in summer. There are also many indications of large bodies of water on Mars. Arrhenius also fails to account for the seasonal variation in the color of the dark spots. Fissures, his objectors hold, would appear at any time against the red background of the planet.

Martinique. An island in the West Indies, one of the Lesser Antilles, belonging to France. The area is about 380 square miles and the population 182,000. The capital city is Fort-de-France, with 27,000 inhabitants. There is a Governor over the colony, assisted by a General Council; and there are municipal elective bodies in charge of local administration. The budget for 1908 amounted to about \$971,950. The revenue for 1909 amounted to about \$929,000. The colony cost France \$233,000 in 1909. The local outstanding debt at the beginning of 1907 was about \$564,200. The Bank of Martinique carries on a good agricultural loan business. The institution has a capital stock of \$600,000, and a reserve fund of \$379,450. Education in the country is dispensed in elementary schools with 13,900 pupils; two secondary and two normal schools; eight private schools; and in a law school with 150 students. Sugar, cocoa, coffee, tobacco, and cotton are the principal products. More than 30,000 acres are devoted to the production of food-crops. Sugar is prepared in 15 manufactures; there are about 60 distilleries. Cocoa exported in 1908 weighed about 11,099,250 pounds; the rum exportation measured approximately 2,742,600 gallons. The total imports for 1909 were valued at \$3,151,350, and the exports at \$4,311,800. The trade with France for 1908 was valued at about \$5,450,250. Coasting vessels and mail coaches carry most of the traffic. Martinique is in touch with the outside world by cable. Vessels entered at the ports in 1908, 260.

MARYLAND

Maryland. A State of the South Atlantic division of the United States, with an area of 12,210 square miles, of which 9,860 square miles is land. The capital is Annapolis, but the largest city is Baltimore, with 650,000 inhabitants. The population of Maryland, in 1910, was 1,295,346, an increase of 107,302, or 9 per cent in the past 10 years. The population of the State per square mile is 130.3. Maryland ranks 27th in population.

Agriculture—Agriculture is an important industry in the State, about 82 per cent of the area being in farms mostly worked by their owners. The chief crops are wheat (11,165,000 bushels, in 1909), maize (21,980,000 bushels), hay, potatoes, vegetables, and fruit. In 1909, the area under tobacco was 25,000, the yield amounted to 17,750,000 pounds, valued at \$1,473,000. Maryland cans 41 per cent of the tomatoes put up in the United States. The dairy output is worth about \$5,320,000; the poultry products, \$3,650,000. The flour mills gave an output of 1,015,866 barrels of wheat-flour, besides corn meal, feed, and offal. The farm animals in the State, on 1 Jan 1910, were: Horses, 160,000; mules, 20,000; milk cows, 160,000, other cattle, 138,000, sheep, 163,000; swine, 273,000. The wool clip in 1909 yielded 687,000 pounds of wool, valued at \$166,000.

Mining and Manufactures—Of mining industries in the State the most important is coal mining, which, in 1908, gave an output of 4,377,093 short tons, valued at \$5,116,753. Some iron ore is also worked. Quarrying is also of importance, the value of the output of stone of various sorts amounting to \$968,437 in 1908. Other products are sand, talc, slate, lime, and natural rock cement. The output of bricks, tiles, pottery, etc., was of the value of \$1,441,099. Pig iron was produced to an amount not stated, from ore imported from other States. The total mineral output in 1909, including pig iron, was valued at \$11,489,062. The manufacturing industries carried on within the State are extensive and various. The capital invested in them in 1905, when the last enumeration was made, amounted to \$201,877,966; they employed 8,624 salaried officials and 94,174 wage earners, the cost of the raw material used was \$150,024,066, and the output was of the value of \$243,375,996. The more important industries (according to the value of output) are thus indicated: Men's clothing, capital, \$9,019,897, output, \$19,654,916; canning fruit, etc., capital, \$6,987,188, output, \$12,686,711; iron and steel, blast furnaces, and rolling mills, capital, \$7,128,091, output, \$12,230,409, foundry and machine work, capital, \$7,523,033, output, \$9,172,034; flour milling, capital, \$2,717,258, output, \$7,318,212; tin ware, copper, and sheet iron, capital, \$14,664,470, output, \$6,833,452; fertilizers, capital, \$6,058,246, output, \$6,631,763. The leading industry is copper smelting and refining; others are petroleum refining, shipbuilding, and the manufacture of cotton duck, but of these industries totals cannot be given. The State has ample facilities for traffic both by sea and land, having 35 railroads with 1,500 miles of line in the State, and 530 miles of electric railroad, while 30 steamboat lines enter the port of Baltimore, which is one of the best ports on the Atlantic coast. The city, since the disastrous fire in 1904, is constructing piers, docks, and wharves, widening streets, construct-

ing a costly sewerage system, improving the water supply, and continuing electric railroads. The harbor channel has been deepened to 35 feet at mean low water. The tonnage entering the port in 1908-09 in foreign trade amounted to 1,207,187 tons, and that clearing, to 1,554,914 tons. The value of the imports was \$24,022,333, and of the exports, \$77,475,293.

Fisheries—The fisheries of the State are valuable, especially the oyster fisheries, which yield more than any other State in the Union. Other fishery products are shad, bass, perch, and various shell-fish. Values of fishing products, about \$3,300,000 per annum.

Government—The present governor is Austin L. Crothers, with a salary of \$4,500. Secretary of State, N. Winslow Williams, Treasurer, Murray Vandiver, Comptroller, Wm. B. Clagett; Adjutant-General, Henry W. Warfield; Attorney-General, Isaac L. Straus—all Democrats. The General Assembly consists of a Senate and a House of Delegates. There are 27 Senators and 101 Delegates. The Senators serve for four years, and the Senate is renewed to the extent of half every two years. Delegates are elected for two years. There is manhood suffrage for United States citizens who have resided one year in the State, six months in the Congressional District, and one day in the precinct next preceding election. Maryland is represented in Congress by two Senators and six Representatives.

Finance—The total assessed valuation of the State in 1909 was \$820,831,339. The bonded debt was \$679,976. During the fiscal year there was received into the Treasury proper the sum of \$5,875,598, to which must be added the cash balance on hand 30 Sept. 1909, of \$1,328,069, aggregating the sum of \$7,203,667. The expenses of the State aggregated the sum of \$6,328,557, leaving a cash balance of \$875,111. In 1908 the net debt of the State amounted to \$366,644.

Religion and Education.—The prevailing forms of religion are Protestant, but Catholics have 35.3 per cent of the church membership in the State. Education is compulsory for children 8 to 12 years of age in Baltimore City and Alleghany County, and 12 to 16 years unless lawfully employed. In 1909 there were in the public, common, and high schools of the State 239,420 enrolled pupils, of whom 44,322 were colored, 5,957 teachers, of whom 843 were colored. The State had three normal schools, with 16 teachers and 389 pupils. The most important institution for higher education is Johns Hopkins University, organized in 1876. It is non-sectarian, and in 1908 had 175 instructors and 683 students. Its hospital with educational features is famous. The Woman's College, founded in 1888, has 42 instructors and 345 students. Other institutions are the Peabody Institute for the Education in Music, the Maryland Institute School of Art and Design, Walter's Art Gallery, Maryland University, Maryland Agricultural College, with 22 professors and 237 students; the Princess Anne Academy for Colored Youths, with 4 teachers and 47 students. Other colleges and institutions are Washington College, 215 students; St. John's College, Annapolis, 207 students; U. S. Naval Academy, 853; Loyola College, Baltimore, 134; Morgan College, 281; Rock Hill College, Ellicott City, 170; St. Charles College, Ellicott

MASCAGNI — MASSACHUSETTS

City, 200; Mount St. Mary's College, Emmitsburg, 302, Notre Dame of Maryland, Baltimore, 270; Kee Mar College, Hagerstown, 95. The Enoch Pratt Free Library has 11 branches, and a recent donation made by Andrew Carnegie of \$500,000 provides for 20 additional branches.

Charities and Corrections.—For charitable purposes the State contains (besides almshouses and asylums for the insane), 117 institutions nearly all provided by private or ecclesiastical charity. They comprise 32 hospitals (one public), 10 dispensaries (two public), 38 orphanages, three day nurseries, 30 homes for adults, and four schools for the deaf and blind (two public). The number of persons admitted (apart from dispensaries and day nurseries) was 25,889, and at the beginning of 1905 there were 5,571 inmates. The care of the poor and management of almshouses is, in general, regulated by local laws, each valid for a particular county or city, but pauper lunatics and minors are cared for under general laws. Pauper children are placed in families or schools, visited by the proper authorities. In 1909 a new State Tuberculosis Sanatorium was opened at Sabillasville.

Legislation.—A regular legislative session was held in 1910. Among other measures passed, the sale of tuberculin and mallein for testing diseased cattle, and of vaccine for glanders, was regulated, and penalties were imposed for selling tuberculous cattle. Twenty-one new sections were added to the automobile law. The State forbade the employment of children under fourteen years of age as carriers of telegrams or messages, and of children under sixteen years of age between the hours of eight at night and eight in the morning for any purpose. The Legislature voted to submit to the people an amendment to the constitution requiring the use at elections of the Australian ballot and defining persons entitled to registration. It also voted to submit another amendment providing for the apportionment of legislative districts and for the government of Baltimore. Esperanto was added to the subjects taught in the schools. A public utilities act passed by Maryland provided for the appointment of a board of members for terms of six years.

Mascagni, Pietro, Italian composer: b. Leghorn, Italy, in 1863, the son of an Italian basket-maker. He developed an unusual talent for music which he studied at home under the most trying circumstances. As early as 1880, when but 17 years of age, he had composed two cantatas, and his work attracting the attention of Count Florestano de Landarel he was sent to the Conservatory at Milan to continue his studies under Ponchielli. He became leader of a traveling opera company and in 1883 wrote his first opera, which, however, was not published and never performed. In May 1890 he entered a competition instituted by a firm of music publishers, and composed the opera 'Cavalleria Rusticana,' which not only won the competition, but was hailed as a masterpiece. This he followed with 'Amico Fritz' and 'I Rantzau,' and in Nov. 1910 completed 'Ysobel,' which is to have its premier production at the New Theatre, New York City, in 1911. This opera took him about two years to write. He started it while director of the Costanzi Theatre, Rome, and completed it in the villa of

his librettist, Luigi Illica, and later in a secluded hotel at Milan.

Massachusetts. A State of New England division of the United States, with an area of 8,040 square miles. The capital is Boston, with 679,325 inhabitants. The population in 1910 was 3,366,416, an increase of 561,070 or 20 per cent in the past ten years. The population of the State per square mile is 418.8. Massachusetts ranks sixth in population.

Agriculture.—The corn acreage in 1910 was 50,000 acres, yield per acre, 45.5 bushels; production, 2,275,000 bushels; price per bushel, 70 cents; total farm value, \$1,592,000. Oats acreage, 7,000 acres; yield per acre, 35.5 bushels; production, 248,000 bushels, price per bushel, 50 cents; total farm value, \$124,000. Buckwheat acreage, 3,000 acres, yield per acre, 22 bushels; production, 66,000 bushels; price per bushel, 85 cents; total farm value, \$56,000. Potatoes acreage, 35,000 acres; yield per acre, 125 bushels, production, 4,375,000 bushels; price per bushel, 70 cents; total farm value, \$3,062,000. Hay acreage, 590,000 acres; yield per acre, 1.28 tons, production, 755,000 tons; price per ton, \$19.10; total farm value, \$14,420,000. Tobacco acreage, 4,400 acres; yield per acre, 1,730 pounds; production, 7,612,000 pounds; price per pound, 15 cents; farm value, \$1,141,000. The number of farms (for agricultural, dairy, and poultry purposes), market-gardens, orchards, flower-farms, grass, and woodland lots, mines, etc., was 119,421. The total agricultural product for the State was valued at \$73,110,496, and the total agricultural property was valued at \$288,153,654. Woodland covers about 1,998,760 acres, having an aggregate valuation of \$39,630,062. Tobacco is grown in the Connecticut Valley, and its total yield was 9,561,453 pounds, valued at \$1,254,300.

Manufactures and Mining.—The census of manufactures in the State, taken in 1908, showed that the total capital invested in manufactures was \$717,987,955, employing on the average 480,134 persons, who earned \$245,207,180, using raw material valued at \$669,259,739, and turned out products worth \$1,172,808,782. The more important industries with their capitals are given as follows: Boots and shoes, \$35,260,028, cotton goods, \$155,510,172; worsted goods, \$53,859,049; foundry and machine shop products, \$60,525,711; leather, tanned, carried and finished, \$26,799,414; slaughtering and meat packing, wholesale, \$8,391,932; paper, \$28,986,844; woollen goods, \$22,783,647; boots and shoes, rubber, \$6,092,026; rubber and elastic goods, \$9,882,958. The returns of the mercantile trade showed that the total value of goods sold by all the mercantile establishments in the State was \$1,384,241,383, of which amount the sum of \$967,009,354 was credited to Boston. The number of establishments represented was 29,045; the total capital invested in them was \$287,966,456. There is very little mining within the State. Iron pyrites is worked to a limited extent in the west. Coal is found, but it is of little value; asbestos, talc and soapstone, infusorial earth, and emery are found, and in 1908, 4,395,040 gallons of mineral waters are sold to the value of \$227,907. Marl, peat, sand, and clay are found throughout the State, and there are extensive brick and earthenware works. The annual output of clay products (bricks, pottery,

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etc.), is valued at about \$1,650,000. There are large stone quarries at Quincey and Rockport. The output of granite is valued at \$2,000,000 a year. Other quarry products were sandstone, trap rock, marble, and limestone, amounting together to the value of \$927,732. The value of all the mineral products (including pig-iron from two blast furnaces) was \$5,928,949, in 1908, the last year for which complete reports are given. A large foreign trade is carried on through the port of Boston, which is port of entry for several foreign steamship companies. The imports (including the trade of Charlestown), were valued at \$89,120,387, and the exports at \$83,375,904. The principal commodities imported are wool, hides and skins, lumber, fibres, cotton, sugar, drugs and dyes, iron and steel manufactures, leather, fruit, fish, coal, fertilizers, spirits, tin, and tobacco; the principal exports are provisions, cotton, cattle and meats, breadstuffs, leather, iron and steel manufactures, paper goods, apples, and cotton and wood manufactures. The value of vessels (including outfit but not wharf property, etc.), registered in Massachusetts in 1905 and engaged in coastwise and ocean commerce was \$21,652,277. The total earnings of these vessels was \$30,513,157. The vessels engaged in foreign trade which entered the port of Boston in 1909 had a tonnage of 2,801,033, and those which cleared, 1,995,196. The tonnage of vessels engaged in the coasting trade and entering the port of Boston was 10,543,526.

Fisheries—The Massachusetts fisheries are important. They employ about 12,000 men, 675 vessels, and 3,694 boats; the value of the products is more than \$7,000,000 per annum. The fish caught include cod, haddock, mackerel, halibut, and herring, besides oysters and other shell-fish.

Government—The Governor of Massachusetts is Eugene N. Foss, with a salary of \$8,000. The Lieutenant-Governor is Louis A. Frathingham; Secretary of State, William M. Olin; Treasurer, Elmer A. Stevens, Auditor, Henry E. Turner, Attorney-General, James M. Swift; Secretary of the Board of Agriculture, J. Lewis Ellsworth; Commissioner of Insurance, Frank C. Hardeson; Secretary Board of Education, George H. Martin—all Republicans except Foss. There is a legislative body consisting of a Senate and a House of Representatives, styled collectively the General Court of Massachusetts. The Senate consists of 40 members elected annually by popular vote, the State being divided into 40 senatorial districts, each of which returns one senator. The House of Representatives consists of 240 members, elected in 173 districts, each of which returns one, two, or three representatives, according to population. There is an annual session of the Legislature. The State sends 2 Senators and 14 Representatives to the Federal Congress.

Finance—The assessed valuations of Massachusetts in 1909 were: Realty property, \$2,870,699,295; personal property, \$899,859,527; total, \$4,770,558,822. Bonded debt, \$79,657,066. The receipts for payments on account of revenue for the fiscal year 1910, including cash in the treasury, are shown in the following statement: Cash on hand, 1 Dec. 1909, \$1,675,173; revenue receipts, \$8,420,229; State tax for 1910, \$5,500,000; receipts from other sources (including corporation tax, national bank tax, etc., dis-

tributing to cities and towns, temporary loans, etc.), \$12,986,342; total receipts, \$28,581,744. Payments on account of running expenses of 1909 and 1910, \$13,481,137, other payments (being a distribution of the corporation, national bank, and other taxes, etc.), \$12,914,176. Cash on hand, 30 Nov. 1910, \$2,186,431. The transactions on account of the several sinking and other funds show the following aggregates for the year. Cash on hand, 1 Dec. 1909, \$3,502,933; cash received from all sources, including transfers, etc., \$19,378,579, total, \$22,881,512. Payments, \$18,378,636. Cash on hand, 30 Nov. 1910, \$4,502,876.

Religion and Education—The chief religious bodies in the State are the Roman Catholic (with 70 per cent of the church membership), then the Congregationalists, Baptists, Methodists, Protestant Episcopalians, and the Presbyterians. There is a State education board. School attendance is compulsory from 7 to 14 years of age. In the school year 1909 the number of teachers required for the public schools (common and high) was 15,088. The total number of pupils enrolled was 530,346, and there was an average attendance of 436,480. The 270 public high schools had 2,179 teachers and 53,958 pupils, and there were 355 private academies and schools with 96,435 pupils. The 10 State normal schools in 1907-08 had 129 teachers in the normal department, and 150 teachers in the model and practice department, while the total number of pupils enrolled was 1,758. Towns having 500 families or householders are required to support a high school, while cities and towns having a population of 20,000 or more are obliged to maintain the teaching of manual training as part of both its elementary and its high school system. Within the State there are 17 colleges and universities, of which 13 are non-sectarian and 4 are sectarian (2 Catholic, 1 Methodist, 1 Universalist). These institutions, with the number of students (Oct. 1909) are Harvard College, 4,054, William College, 528, Amherst College, 527, College of the Holy Cross, 435; Massachusetts Institute of Technology, 1,476; Boston University, 1,514.

Charities and Corrections—There are in the State 11 public institutions for the insane, 2 for the feeble-minded, 1 for inebriates, and 1 for epileptics, and, in addition to these, there is one large private institution for the insane and 19 smaller institutions for one or more of the above classes of patients. The whole number of insane at the beginning of 1910 was 12,052, of which number 11,733 were in the public institutions. Of the total number 5,721 were males, and 6,012 were females. The total number of feeble-minded in the State was 1,607, of whom 943 were males and 664 were females. Each city and town must support the indigent poor lawfully settled therein, settlements of adults being acquired in general by residence for 5 consecutive years and payment of taxes for any 3 years within that time, or by 3 consecutive years' residence on a freehold owned by them. Elected or appointed overseers of the poor in towns and cities provide for the poor by out-door relief, or by boarding them (under contract and inspection) with other families, or in almshouses. Liability to support of relatives extends to parents, grand-parents, children, and grandchildren. At the beginning of 1909 the number of paupers

in almshouses was 6,176, and the average number during the year previous, 6,440. Besides insane asylums, etc., there are in Massachusetts 604 incorporated charitable institutions, comprising 104 hospitals, 9 dispensaries, 79 homes for aged people, 59 homes and schools for children, 18 temporary homes, and 335 miscellaneous institutions. The total current expenses of 497 corporations which made returns amounted to \$6,473,637, the total value of property owned and occupied for corporate purposes was \$22,224,262. The total amount of investments was \$31,076,988. The whole number of beneficiaries reported was 596,890, besides 7,478 families and 150 institutions. In the five State penal institutions and 21 county jails or houses of correction there were 7,599 prisoners. Of the 32,077 sentenced during the year 1908, 1,930 were for crimes against the person, 4,179 against property, 25,968 against public order. Of the sentences for offenses against public order, 20,779 were for drunkenness, leaving only 5,189 for all other offenses in that class.

Legislation—A regular legislative session was held during 1910. The Legislature defeated a proposition submitted to it with the approval of the previous year's Legislature for a taxation amendment to the constitution which would permit a classification of property at different rates of taxation. The previous Legislature was led to submit the amendment by an adverse Supreme Court decision upon the constitutionality of a scheme for a uniform low tax rate on certain forms of investment which had been proposed in a report of a Tax Commission as a solution of part of the perennial difficulty with the general property tax. The Legislature of 1910 was led to its adverse action by a special report of a committee of three, which took the ground that the proposed amendment would open the way of discrimination, injustice, and oppression. The Massachusetts Legislature submitted to the Legislature of 1911 amendments permitting the Legislature by special act to authorize the taking of sufficient extra land on both sides of a proposed or improved highway so that the sale of the surplus after the improvements should be completed would help to defray the cost of the changes. Obscene shows "tending to corrupt the morals of youth" were made punishable in the State. It was enacted that prison-made goods be sold to public institutions and not in the open market—a law for which union labor has been stoutly contending. Massachusetts made several efforts at reform in judicial procedure. Following the report of the Commissioners of Uniform State Laws, Massachusetts gave its assent to the bills of lading and certificates of stock in corporations acts.

Mathematical Society, American. During 1910 five meetings of the Society were held in New York, two in Chicago, and three sectional meetings in the western States. The total number of papers presented was about 150. The Society is about to issue two special volumes, the 'Princeton Colloquium Lectures' and a second edition of Klein's 'Evanston Lectures.' The 'New Haven Colloquium Lectures' appeared in the summer of 1910.

Matsukata, Marquis M., Japanese statesman: b. Kagoshima, Japan, in 1835. He received a military and literary education, such as was common in the Satsuma clan, and

obtained a naval training in Nagasaki. He was chamberlain to the Lord of the Satsuma clan; took part in the political movement which resulted in the overthrow of the Shogunati and at the time of the restoration he was appointed a local governor. In 1870 he was connected with the financial administration of the government and was active in encouraging agricultural and industrial enterprises. He visited Europe in 1878 as president of the Japanese section of the Paris Exposition; was appointed Minister of Affairs in 1880, Minister of Finance in 1881, and in 1884 was created a count. He was appointed Premier in 1891 and in 1895 was again appointed Minister of Finance, but resigned soon afterwards. In 1896 he was appointed Premier and Minister of Finance, but resigned in 1898 and was reappointed Minister of Finance in October 1898, serving until October 1900. He was mainly responsible for the post-bellum financial administration and the adoption of the gold standard, which were the most important incidents in the history of Japan in recent years. In 1902 he visited America and Europe, and was elected president of the Japan Red Cross Society in 1906. While in England in 1902 he was created an honorary Knight of the Grand Cross of St. Michael and St. George by King Edward VII and the honorary degree of DCL was conferred on him by Oxford University. In 1906 he was created a marquis in recognition of his services as financial advisor during the Russo-Japanese War, and he also holds the order of the Grand Cordon. Marquis Matsukata is accorded by the Emperor of Japan the same consideration as a minister of state in recognition of past services. He is the author of 'Report on the Adjustment of Paper Currency' (in Japanese); 'History of National Debts in Japan'; 'Report on the Adoption of the Gold Standard in Japan'; and 'Report on the Post-Bellum Financial Administration in Japan' (all translated into English); and 'Notice Historique sur la Reforme de l'Impot Foncier au Japon' (written in French).

Matthews, Mark A., American clergyman: b. Calhoun, Ga., 24 Sept 1857, and was educated at Calhoun. Ordained in 1887, he became pastor of the First Presbyterian Church, Calhoun, where he remained until 1893, when he went to Dalton, Ga. Here he continued for three years, and then became pastor of the Presbyterian Church at Jackson, Tenn. In 1902 he became pastor of the First Presbyterian Church, Seattle, Wash., and now ministers to the largest congregation of any Presbyterian church in the world, and in point of membership, the second largest church in Christendom. Doctor Matthews' remarkable sermons have done much to bring to him the following he enjoys, but it is principally because he makes the church all in all to his flock that he has met with such overwhelming success—a success which it requires an annual outlay of more than fifty thousand dollars to maintain. Despite this large expenditure, the church is worth close to half a million dollars. In it is a large library and four small ones, a swimming pool, a running track, a gymnasium, fifty telephones, a new ventilating system which cost \$16,000, enough ranges to cook dinners for 500 people, and innumerable bath-rooms and bath tubs, besides the typewriters, graphophones, and mimeographs which the pastor uses in his own private study. Dr. Matthews studied law

and was admitted to the bar June 1900. Besides his numerous other offices, he is Past Eminent Commander of the Seattle Commandery and has special committees among the lodge members for spreading the Gospel throughout the Masonic order. Doctor Matthews has organized three churches in Seattle besides his own and has systematized the entire religious organization of the Presbyterian church in that city.

Matz, Nicholas Chrysostom, American R. C. bishop. b. Munster, Alsace-Lorraine, France, 6 April 1850. He received his education at the Petit Seminaire, Finstingen, France, and in 1868 he emigrated to the United States and studied for the priesthood at the College of St. Mary's of the West, Cincinnati, Ohio. He was ordained 31 May 1874 at Denver, Col., by Vicar Apostolic Machebeuf, and was assistant pastor at the Denver Cathedral, 1874-77; pastor at Georgetown, Col., 1877-85; and of St. Ann's, East Denver, Col., 1885-87. When the diocese of Denver was established in 1887, he was appointed coadjutor to Vicar Apostolic Machebeuf who became first bishop, and he was consecrated at Denver 28 Oct. 1887 by Archbishop Salpointe, his title being Bishop of Telmasse. On the death of Bishop Machebeuf, 10 July 1889, he succeeded to the see of Denver.

Mauritania. Until 1909 a Civil Territory occupied by the French in West Africa, extending along the Niger River. The colony is now an actual Protectorate, however. It is composed of the divisions, Trarza, Brakna, Gorgol, and Gudimaka. The area is estimated at about 344,000 square miles, and the population put at 400,000. The administration is effected through a Commission, which is responsible to the Government of French West Africa. French influence among the Moors of the territory resulted in French occupation of the country about 1903, when it was politically swallowed up by the colony of Lower Senegal to the south. Particular data relative to the Protectorate's progress, are not available, but are included in the statistics of the governing colony.

Mauritius. An island under British possession, in the Indian Ocean, 500 miles from Madagascar, eastward. The area is about 720 square miles. The population is estimated at about 375,400, of whom 206,100 are Hindus. The emigrants in 1908 numbered over 900. The capital is Port Louis, which had 52,750 inhabitants in 1901. Birth rate, 35 per cent. of population. Britain obtained the island at the treaty of Paris 1814, prior to which time it had been in Dutch and French possession at various periods. The Government is representative in part only. The Governor is assisted by an Executive Council and a Council of Government. The latter is composed of 27 members, 9 nominated, 8 ex-officio, and 10 elected. All the county districts are represented by one member each. The capital sends two members to the council. The revenue for 1909-10 amounted to about \$2,940,000, and the government expenditure to about \$3,207,000. The public debt was about \$6,366,700. The 1908-09 revenue was mainly created by contributions from the customs (\$1,075,000), licenses and permits (\$615,000), and railways (\$690,000). Government savings bank deposits totaled \$875,150 in 1908; depositors, 26,400. The government expenditure on education amounted in 1909 to

more than \$200,000. The government schools had an enrollment in 1908 of about 8,350, State-aided schools 10,200. Secondary instruction is furnished in 20 royal schools and a college (about 400 pupils), and in 22 associated schools, with 390 pupils. There are approximately 113,000 Roman Catholics in Mauritius, 41,000 Mahomedans, and 6,600 Protestants. There are a Supreme Court, and inferior courts in the country. Sugar is the chief product of Mauritius. Indians and Chinese control a great many of the sugar plantations. The imports into the country comprise a majority of the articles of ordinary consumption, and come principally from India, Australia, and Africa. Total imports in 1908-09 were valued at \$9,645,700, and exports at \$10,797,000. The latter comprises sugar, rum, vanilla, aloe fibre, coconut oil, and molasses. The sugar exportation was worth about \$9,631,800. There are 120 miles of railway line, 330 miles of telegraph line, and 55 of telephone. There is cable communication with Australia, Zanzibar, and Madagascar. Postal communications to the number of 3,162,250 were handled in 1908 by the postoffice of the island.

Mayotte and the Comoros. A French possession approximate to the Island of Madagascar. The colony consists of the Islands of Mayotte, Anjouan, Grande Comore, and Moheli. The total area is about 760 square miles, and the population about 97,650. The island of Mayotte alone has an area of 140 square miles, and a population of about 12,000. Of late years large numbers have been removing to Madagascar and Zanzibar. The colony came under the administration of the French Government at Madagascar in 1908. In 1910 the Sultan of Grande Comore preferred French dominion. The local revenue and expenditure for 1907 was about \$49,500, and the public debt at the beginning of the year, \$176,750. Education is promulgated in three schools with three teachers and about 80 pupils (1902). There is a hospital building, which cost France about \$600. The faith of the Mussulman is that accepted by nearly all the inhabitants. The chief products of the Comoros are vanilla and sugar. Other articles of produce are cacao, alois, and perfume plants, etc. There are two distilleries, and three sugar works. Forests in Grande Comore are valuable, timber being shipped in considerable quantities. The imports into the country in 1908 were valued at about \$270,000, and the exports from the Islands to about \$575,000. Sugar used to be the great article of export, but vanilla is now a rival product and export.

Measuring High Flights. See AVIATION, MACHINE FOR MEASURING FLIGHTS.

Meat, Inspection of. It is only within the past three or four years that the American public has been aroused to its duties with regard to the purity of the meat distributed by the great packing houses. Prior to 1906, no strict investigation had been made of the methods in vogue; but during that year, the publication of Mr. Upton Sinclair's book, 'The Jungle,' followed by the investigations of government and other committees disclosed the astonishing fact that a large part of the meat placed upon the market was far from clean; and that, in fact, the methods of handling and preparing these food products were not only uncleanly, but

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dangerous to health. A great stir was created by these revelations, and much reform work was undertaken. Stricter inspection was enforced, and, whereas this had been little more than perfunctory, it now became more strict; and the result was that more carcasses were "condemned" during 1906 than ever before.

While much reform has been accomplished, there is still urgent need for further investigation and inquiry. The laws governing the inspection of meat are still far from ideal, and, in many cases, only parts of animals suffering from diseases are condemned; and the remainder of the carcass is allowed to be cut up, and shipped to consumers as the meat of healthy animals. The following quotations from the Government Regulations (1904) regarding meat inspection will make this clear.

"All animals found on post-mortem examination, to be affected with any of the diseases or conditions named below, shall be disposed of according to the following instructions. . . .

"1 The carcass may be passed when the lesions are limited to one group of lymphatic glands or one other organ.

"2. The carcass may be passed when the lesions are limited to two groups of visceral lymphatic glands in either the thoracic or abdominal cavity.

"3 The carcass may be passed when the lesions are limited to two visceral organs (other than lymphatic glands), in the thoracic or abdominal cavity, provided the lesions are slight, calcified and encapsulated.

"4. The carcass may be passed when the lesions are limited to one group of visceral lymphatic glands and one organ in the thoracic or abdominal cavity, provided the lesions in the affected organs are slight.

"5 The carcass may be passed when the lesions are confined to two groups of visceral or lymphatic glands, and one other organ in the thoracic or abdominal cavity, provided the lesions are slight, calcified, and encapsulated.

"6 The carcass may be passed when the lesions are confined to the lungs, the cervical lymphatic glands, and one group of the visceral lymphatic glands of the thoracic cavity, provided the affection is slight, and the lesions are calcified and encapsulated." (Twenty-first Annual Report, Bureau of Animal Industry, p. 577)

These conditions certainly needed rigorous revision. They implied this. That carcasses found to be affected with tuberculosis, etc., must not be condemned, but that certain portions of them may be passed as fit for food.

It is true that these regulations have received several modifications since they were originally passed, but the substance remained as it was. The regulations of 1906 were, as a matter of fact, just as favorable to the butchers and packers, though they were supposed to improve matters considerably. The regulations concerning meat-inspection, passed 1 April 1908, and now in effect, are much the same,—in spite of all the agitation which has been made for better meat. Thus.

"Rule C.—The carcass, if tuberculous lesions are limited to a single or several parts, or organs of the body (except as noted in Rule A), without evidence of recent invasion of tubercle bacilli into the systemic circulation, shall be

passed after the parts containing the localized lesions are removed and condemned."

But this does not extend to the carcasses of animal suffering from tuberculosis only. It is the same in many cases of malignant tumors, actinomycosis, etc. As a concrete example of this, the following passage from the regulations may be quoted:

"Section 11, Paragraph 2—Carcasses of animals showing uncomplicated localized actinomycotic lesions, other than, or in addition to, those specified in paragraph one of this section, may be passed after the infected organs and parts have been removed and condemned."

Actinomycosis is a loathsome disease presenting many of the external appearances of cancer in its worse form, and known to farmers as "lumpy-jaw." Yet the carcasses of animals suffering from this disease are permitted to pass out to the world as food, after the organs are removed. Surely, there is need for thorough revision here. It is the same with other diseases. The present Regulations, passed April 1908, permit the use for food of the carcasses of animals (hogs) suffering from swine-plague and hog-cholera, provided the diseased organs are removed. The paragraph reads:

"Provided they are well nourished, carcasses showing slight and limited lesions of these diseases may be passed."

The following are quotations from the existing Regulations regarding meat inspection, passed April 1908.

"Malignant Epizootic Catarrh.—The carcasses of animals affected with this disease, and showing generalized inflammation of the mucous membranes with emaciation, shall be condemned. If the lesions are restricted to a single tract, or if the disease shows purely local lesions, the carcass may be passed."

"Section 16.—Carcasses of animals affected with mange or scab, in advanced stages, or showing emaciation or extension of the inflammation of the flesh, shall be condemned. When the disease is slight, the carcass may be passed."

"Section 21.—Hogs affected with urticaria (diamond skin disease), tinea tonsurans, demodex folliculorum, or erythema, may be passed, after detaching and condemning the skin, if the carcass is otherwise fit for food."

In the Regulations of 1904, it is stated concerning carcasses of animals affected with mange, that "when the disease is slight, and the carcasses are in good condition, they may be passed." In the Regulations of 1908, the words "and the carcasses are in good condition" have disappeared. Here, then, in an instance (among many) in which the meat-inspection laws have become worse instead of better, in spite of all the stir and legislation in favor of cleaner and purer food.

"Section 12.—When the lesions of caseous lymphadenitis are limited to the superficial lymphatic glands, or to a few nodules in an organ, involving also the adjacent lymphatic glands, and the carcass is well nourished, the meat may be passed, after the affected parts are removed and condemned."

"Carcasses of animals slightly affected with tapeworm cysts may be rendered into lard or

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tallow, but extensively affected carcasses shall be condemned" (p 15.)

"Section 17, Paragraph 3—Carcasses or parts of carcasses found infected with hydatid cyst (echinococcus) may be passed after condemnation of the infected part or organ."

These are some of the rules and regulations which pertain to the inspection of meat in the United States. From these quotations it is perfectly obvious that there is urgent need for further reform in the selection and condemnation of meat, and that thousands of pounds of diseased meat which should have been condemned find their way every year onto the tables of American families. Efforts to right this condition of affairs have failed completely. One example will make the reason for this clear. In Feb. 1907, a committee met at Washington to discuss this question of diseased meat, and the steps to be taken to prevent it. The committee sat for two and a half days, were assisted by a representative of the meat trust; and at the end of that time, stated their unanimous conviction that the present method of inspection is adequate and recommended no changes or alterations. No evidence was heard, and the details of the meeting have never been made public.

Commenting upon this famous meeting, Dr. Leffingwell says ('American Meat,' pp. 155-56):

"In England, when a great question like this comes into the arena of public opinion, a Royal Commission is appointed, as members of such commission, men of opposite views find a place; all evidence is welcomed which tends to elucidate facts; the sessions may extend over months; and, no matter to what conclusion the majority of such commission may arrive, there is a mass of evidence made public which is of permanent value. In America, a packed committee, probably made up of men who are in practical agreement, holds private sessions for two and a half days; is assisted by the presence of the meat trust's representative, endorses all the practices in vogue, and we are still invited to regard their judgment as a determination of the question involved. Is this the part of wisdom? In America, men have come to view with some suspicion the opinions of experts selected to testify upon matters involving vast financial interests, or questions of life and death. . . . What abuses, if any, did this committee point out? Not one. The most careful comparison, . . . will fail to disclose in the Regulations now in force a single prohibition more favorable to the purchaser of American meat than existed in the regulations of 1904 and 1906. . . . In many respects the new rules are distinctly worse than those which they supplanted."

A great amount of slaughter also goes on without any government inspection in various parts of the country. There are three main sources of meat supply: (1) wholesale houses; (2) slaughter by small butchers; and (3) farm slaughter. The first of these we have considered; and the second does not affect the population to any extent, though a certain number of persons living in the immediate vicinity of a local slaughter-house of this description are often supplied by the butcher. The slaughter by small butchers is, however, a great menace to public health, and thousands of pounds of meat, much of it diseased, are an-

nually circulated from such quarters, and sold at the same price as meat which had been subjected to federal inspection.

These small or local slaughter-houses are, in the majority of cases, filthy and unsanitary in the extreme. The drainage is not attended to, and offal is not disposed of for days together. Rats are free to run about and under the slaughter-houses almost at will and mix with the meat, spreading infection. In a recent report made by the State Board of Health of Indiana it was asserted that.

"Of the 327 slaughter-houses inspected, only 23, or about 7 per cent, were found to fulfill the sanitary conditions." "At nearly all slaughter houses inspected, foul, nauseating odors filled the air for yards round. Swarms of flies filled the air and the buildings, and covered up the carcasses which were hung up to cool. Beneath the houses were to be found a thin mud or a mixture of blood and earth, churned by hogs, which are kept to feed upon offal. Maggots frequently existed in numbers so great as to cause a visible movement of the mud. Water for washing the meat was frequently drawn from dug wells, which receive stoeage of the slaughter-house yard, or the water was taken from the adjoining streams, to which hogs had access. Dilapidated buildings were the usual thing, and always the most repulsive surroundings and odors existed. Slaughter houses of fair sanitary condition were not found. They were all abominably bad or else met the standard completely."

Such are the surroundings of many of the local slaughter houses. At one of these places, 1,000 cattle and 2,500 hogs per month are killed. The only "inspection" is furnished by one inspector from the Board of Health, and this inspector is not a veterinarian. Previous to his employment by the board of health, he was a hotel porter. In many of the houses no inspection at all is made; but the locality is supplied by this meat. Sick and diseased cattle are killed and their flesh sold at the same price as that of healthy cattle, and the same is true of sheep and hogs. In all these cases, the "trimmings" are used so extensively that they are now valued by the butchers as worth about 14 per cent of the whole animal. (Consult, Dr. A. M. Farrington's Report to the Bureau of Animal Industry, Circ. 154; and Mr. F. W. Wilder's book, 'The Modern Packing House'.)

The unwholesome and unsanitary condition of some of the abattoirs has, however, at last led to an effort to better the existing conditions; and, in his annual report to the legislature, Raymond A. Pearson, Commissioner of Agriculture, recommends that legislation be provided for the proper surveillance over the abattoirs of the State. The commissioner points out that practically only the inspected meat sold in New York State is the product of the abattoirs enjoying Federal inspection,—which is limited to those plants doing an interstate business; and it is a matter of common knowledge that live stock which would not be accepted by such plants is sometimes taken to abattoirs where no inspection obtains, and the meat is sold wholly within the State. Thus, the Federal meat inspection service—the proportional cost of which borne by the people of New York State being about \$300,000 per annum—does not serve fully to protect the

markets of this State against unwholesome meat and does serve to give an advantage to live stock interests of other States that desire to market their products in New York State

It is obvious from all this that the need for reform in meat-inspection is very imperative; that but little, if any, true reform or improvement has, as a matter of fact, been made. It is earnestly to be hoped that, within the next few years, we shall see a complete readjustment of the existing conditions, improved regulations, and stricter inspection

Mechanical Engineers, American Society of. This organization held its annual meeting in Dec 1910, in New York, electing its officers and listening to a number of interesting papers. Among the papers were 'Test of a 10,000 Kilowatt Steam Turbine,' by Sam. L. Naphtaly, of San Francisco; 'Test of a 9,000 Kilowatt Generator Set,' by F H Verney, of San Francisco; 'Notes on the Value of Napier's Coefficient with Superheated Steam,' by Isaac Harter, Jr, of Bayonne; 'Transmission of Heat in Surface Condensation,' by George A. Orrok, of New York; 'Combustion and Boiler Efficiency,' by Edward A Uehling, of Passaic; and 'Automatic Control of Condensing Meter,' by B. Viola, of Brooklyn.

Medals, Carnegie. See CARNEGIE MEDALS

Medical Association, The American. The American Medical Association is a scientific organization which meets annually when a scientific program is presented which is grouped into thirteen sections representing the various divisions of the science of medicine. During the year, the Association publishes the Journal of the American Medical Association and issues two monthly medical magazines in addition to a number of reports of committees and councils of the Association. The energies of the Association are devoted to the investigation of medical education, efforts to secure for the people the greatest degree of protection and to the profession the greatest justice by the enactment of uniform medical laws, the systematic education of the public in matters relating to public and personal hygiene, the prevention of blindness, the care of dependents, the prevention of the propagation of the insane and criminal and like topics. The passage of such laws as shall secure for the people pure, wholesome food and pure drugs, the adoption of a uniform system of nomenclature and classification of diseases, the education of the people in regard to the dangers of the patent medicine frauds, and of the profession in regard to the composition and effects of proprietary drugs, are some of the problems which the Association is undertaking to study. This is accomplished by various committees and councils. The Council on Pharmacy and Chemistry is interested in the study of the various products that are offered for use in the care of the sick and are not included in the recognized pharmacopeia. The Council on Health and public Instruction has under its care the subjects of the legislation, organization and the instruction of the public, the defense of medical research and matters relating to the public health. The Council on Medical Education devotes itself to the study of medical education and suggests means and methods by which the Association may favorably influence such education. In addition to

these, there are a number of special committees, whose work is carried on from year to year.

Medical Freedom, League of. In June 1910 was started the League of Medical Freedom, with the avowed object of "maintaining the rights of the American people against unnecessary, unjust, oppressive, paternal, and un-American laws, ostensibly related to the subject of health." The organization aims specifically at the defeat of the recently launched project of the American Medical Association to found a Federal Department of Health, which shall exercise jurisdiction over matters medical all over the United States, having absolute power. This, the League of Medical Freedom maintains, would constitute a national calamity. The League has B O. Flower, the Boston editor, as its president, William R Brown, of Indianapolis, as first vice-president; and A. P. Harsch, of Toledo, as secretary. These gentlemen and the many who have followed them claim that what the American Medical Association proposes would constitute a literal medical trust, since the department, if established, would be dominated entirely by the Medical Association, which, they say, has always sought to suppress those not conforming to its own theories as to the proper methods of healing. There are to-day in this country millions of intelligent citizens whose belief in regard to the healing of the body is diametrically opposed to that of the regular medical profession. There are now several large and constantly expanding schools or systems of thought, the members of which have been restored to health and the enjoyment of life after being given up as hopeless by the medical profession. These people naturally have no faith in regular medical treatment. When sickness assails them, they wish to avail themselves of the treatment which previously brought relief. Under the system of a Department of Health they would be unable to do this. This, the new league holds, is a clear-cut case of restraining man's free-will, hence is oppressive, and opposed to the broad principles upon which this nation is founded. In this belief the League of Medical Freedom is conducting a widespread campaign and expending thousands of dollars in fighting the American Medical Association.

Medicine. Tremendous progress has been made in every line of research—in surgery, in bacteriology, in psychotherapy, in serum-therapy, in diagnosis, in hydropathy, electricity, medicine itself—in fact, it would be impossible to attempt an epitome of such work,—much of which is, however, described under the headings of the various subjects mentioned. Great strides have been made in the conquest of disease; but new diseases are ever coming to the front, as a result of modern civilization, and baffling medical science by their insidious undermining of the bodily health in a way hitherto unknown. Civilization itself seems to bring in its train certain new diseases from which men had always been free until the modern industrial methods supervened. They are in very truth new diseases, because they are induced by the particular trade or profession followed by the man or woman who, later, develops this particular disease. Dr. Hobart A. Hare, of Philadelphia, in a recent article, said:

"As civilization increases from year to year, it necessarily brings about changes in the habits, customs, and surroundings of the people, and, this being the case, it is not a difficult matter to understand how many of the diseases from which our forefathers suffered have changed their form,—owing to the changes which have been brought about in their birthplaces and in the systems of their victims. As each year goes by, new processes of manufacture, etc., come into use, many of which are injurious, either directly or indirectly, to the persons so employed, or to the surrounding population, either by contaminating the air which they breathe or more frequently the water which they drink.

"The rapid increase of population, owing to an increase of birth-rate and enormous immigration, must of necessity create a certain amount of crowding in our large cities, and by this means a lower sanitary condition is reached by all. Although such conditions of life are exceedingly hurtful to those who are the direct cause of the crowding, the evil effects are unfortunately not alone confined to so limited an area, and the neighboring population, provided with much better sanitary conditions and surroundings, are made the victims of their fellowmen's carelessness, poverty, or filth. By the crowding of dwellings and mills along water courses we have a ready source for the distribution of all the diseases whose lesions are situated in the gastro-intestinal tract, and also many of the diseases whose lesions are manifested in the kidneys. By this same increase in population and manufactories, the air is more contaminated than is healthful by the breath of mankind and animals, and gases, and smoke resulting from the combustion of large quantities of fuel for heating, and the production of motor power for manufacturing purposes. Thus it is clear that the increase in many of our ailments is due to the increase in the number and fertility of our hotbeds of disease."

From this increase in number and fertility, it is natural that certain diseases should increase in frequency and virulence, and by arising from such favorable soil for growth, it is but natural that some of their major as well as their minor characteristics should undergo a change to a greater or lesser extent.

Caisson disease is probably the newest and most mysterious of these maladies. With the construction of tunnels, foundations, etc., which necessitate the workmen living for hours together in air at a high degree of pressure,—as well as the work in submarine boats, etc.,—this disease has developed; and for long presented a most baffling puzzle for physicians. Even yet there is a certain disagreement as to the details of the mechanism of the disease. Some authorities ascribe the disease to the liberation of air in the blood under the high pressure of the working chambers; others to the presence of nitrogen in the blood and brain and spinal cord fissured by its release; still others to congestion produced by changes in the circulation—a "bubbling of the blood"—caused by the removal of the air pressure.

Another disease that has developed, among physicians principally, is a peculiar condition of the hands and arms, due to constant treatment with the X-Rays. These rays seem to

have a remarkable effect upon human protoplasm; first, the flesh, too-often exposed to the rays, becomes hot and burned as if by sun-burn. Then it takes on the appearance of being scalded. Cancers occasionally develop—as was the case with one of Edison's assistants—and the limbs have to be amputated. This is usually vain, however, and the patient dies as a result of his injuries. Of course, only a limited number of X-ray operators are injured in this manner; and, with modern improvements—working behind lead screens, etc.,—these risks will doubtless be reduced to a minimum. This is a disease, however, which has certainly been developed since the introduction of the X-Ray treatment.

Under the general heading of "professional neuroses," a group of minor ills is classified,—such as writer's cramp, telegrapher's cramp, typewriter's cramp, etc. As a result of overwork, certain muscles develop a form of paralysis. Piano players sometimes develop a very similar form of palsy.

Men that work in coal mines develop a peculiar form of eye disease. After a certain stage of fatigue, dancing lights are seen; the patient becomes dizzy, and stumbles about. Then the eyelids begin to quiver and the eyeballs to oscillate, moving round as often as 60 or 100 times a minute. At first the patient finds relief in holding the head well back, and looking downward; but later, as the disease progresses he is obliged to stop work. For long it was thought that this form of disease resulted from bad air or ventilation, or to the oil lamps that were used; but it is now believed that this is due to the constant upward gaze of the eyes, as the men work, lying on their side, and "undercut" the coal where they are working.

A large number of deaths take place every year, due to the peculiar conditions present in the factories in which men are obliged to work. In some cases, minute particles of steel, etc., find their way into the lung tissue, setting up chronic inflammation, and finally bronchial diseases or tuberculosis. On the other hand, a number of deaths are due to the fumes of chemicals employed in the manufacture of certain products. As a result of a recent investigation by the government, it was asserted that out of every 1,000 persons, the following number die of the diseases named:

WORKERS IN	Con- sumption	Pneu- monia	Digestive Disorders
Metallic dust	38 0	17.4	17 8
Mineral dust	25 2	5.9	16 6
Mixed dust	22.6	6 0	15 2
Animal dust	20 8	7 7	20.2
Vegetable dust	13 3	9.4	25.7
Non-dusty trades	11.1	4.6	16 0

Among workers in woollen factories, it is well known that many of the workers develop phthisis, having contracted this disease by breathing into the lungs fibres of cotton wool. The noise and roar of great cities is known to develop deafness, and even insanity. Men who work in gas factories, match, and lead factories are also subject to peculiar diseases, which are never found save in those who work under such conditions. Modern industries are thus responsible for many of the diseases which the physician is called upon to combat.

Heart disease has always been considered one of the dread maladies which afflicts man-

kind; but lately the new laboratory of Johns Hopkins University Hospital has been installed with an apparatus known as the electro-cardiograph, which is designed to study this disease; and it is hoped that much may be learned by its means,—both as to its causes, and in this way, its possible treatment. The instrument, which has recently been perfected by a Dutch physician, Dr. W. Einthoven, of Leyden, is designed for the purpose of giving an exact indication of the varied heart-action of the patients studied. It is well known that each beat of the heart gives rise to a series of weak electric currents, ranging in intensity from one-tenth-thousandth to three-thousandths of a volt. The currents are too feeble for the ordinary galvanometer to record.

The instrument devised by Doctor Einthoven consists of a very fine filament of quartz or platinum, about 1-12,000 of an inch in diameter, suspended in the magnetic field of a large and powerful electro-magnet. This filament is so fine that the slightest current from the patients' heart causes it to sway to and fro. A powerful arc-light behind it causes its shadow to be thrown through a strong magnifying glass upon the moving film of a camera, which records each movement. Then, by comparing the film with one showing a normal heart movement, the exact trouble can be accurately diagnosed.

The "heart station" is under the charge of Drs. Lewellyn F. Barker, Arthur H. Hirshfelder, and George S. Bond. These physicians predict that, with the new apparatus, many forms of obscure heart trouble will be successfully diagnosed.

A most important statement was made, during the last month of 1910, by Dr. Samuel W. Lambert, dean of the New York College of Physicians and Surgeons. It is in connection with Doctor Ehrlich's famous medicine "606," but it is an extension of that, which is said to apply to many forms of disease. Whether or not the new remedy will prove as valuable as it is thought to be, must be seen by later developments and research; but the outlook is promising. It is thought that the new remedy will kill not only one form of bacilli, but many forms. The drug which is to accomplish this was discovered by accident as follows: Some of the famous "606" was, by chance, left within glass tubes from which the drug had been taken, and in fusing up the ends of the tube, the contents had become heated. The process of heating apparently increased the toxic effects of the drug, which was now found to be destructive, not only to one class of germs, but to many. This was discovered by Doctor Eitner, and the *Journal of the American Medical Association* in commenting on his discovery, says: "Eitner never uses methyl alcohol, so that the disturbances cannot be explained in this way. To say that this discovery will mean a revolution in medicine and surgery is to put the question in mild form."

The year 1910 was one of the most important in the history of medicine,—a number of epoch-making discoveries being made, and genuine knowledge in various directions being gained. The discovery of Ehrlich's remedy alone is one of the most important in the whole history of medical science; and the experiments of Doctors Flexner and Carrell, of

the Rockefeller Institute, have proved both illuminating and of wide significance. (See SYPHILIS, NEW CURE FOR). By means of vivisection, a discovery was made at the Rockefeller Institute which may revolutionize medical treatment, in certain cases, it being that organs can be removed, "crossed," transplanted, kept alive, and even made to grow outside the body, after being removed for several days. It is hoped that cancer and various diseases may be studied in this experimental way, outside the body, in the near future.

The work of Dr. Louise Rabinovitch, a young woman physician, in electrical anæsthesia, has created a considerable impression,—several successful operations having been undertaken, after the patient had been anæsthetized by means of electricity.

Stovaine, strychnine, for the much talked-of spinal anæsthesia, which permits the patient to remain perfectly conscious during the operation, introduced into this country by Dr. Thomas Jonnesco, a Roumanian surgeon, has been tried out extensively. Opinion is divided as to its efficacy. Doctor Babcock reports a long series of cases in which he has used it with uniform success, while other physicians, both here and abroad, are not so enthusiastic. Spinal anæsthesia has certain advantages, and many doctors consider it superior to ether and chloroform. On the other hand, some doctors hold that it is a disadvantage to have the patient conscious during the operation.

Investigations are now being carried on in a large number of laboratories as to the cause of cancer; but so far, the only general conclusion arrived at is that the only hope consists in early operation and early treatment.

One entirely new disease was discovered in this country during 1910, it being known to the medical fraternity as Sulph-Hemoglobinemia. The causes of the disease are not known in detail, and doctors freely admit that they are in the dark as to its etiology. So far, only about eight cases of the disease are known to exist in the world. Drs. T. Wood Clarke, of Utica, N. Y., and Robert M. Curtis, of Paterson, N. J., jointly published the report of the first case seen by them on American shores—they having had the opportunity of seeing several cases of this character in Europe. Detailed chemical tests are necessary to ascertain the presence of the disease, which means, literally, the presence in the blood of sulphuretted hydrogen. The red corpuscles are the chief sufferers. In their official report on this case of a new disease, Doctors Clarke and Curtis say:

"The case which we have to present is of considerable interest for three reasons: (1) It presents a very striking clinical picture; (2) it is of exceptional interest from the standpoint of physiological chemistry; and (3) though we do not believe that it is the first case of the kind which has occurred in America, it is unquestionably the first one to have been diagnosed on this side of the Atlantic Ocean, and when it is published it will be the eighth case to have appeared in literature. . . .

"In Sept. 1909, the patient whom we now report made her appearance at the office. . . . The patient, a woman of 24 years of age, had never been robust, having suffered from most

of the ills to which woman is heir. A few days previously she had noticed that her lips had become blue and her color ashen, although she herself did not feel ill. She was somewhat weak. Her appearance at that time was much as it is to-day. Her skin was of a steel blue, and her lips purple black. The general appearance has been described as being cadaveric, or better as 'of the ghastly hue seen in a person standing under the Cooper-Hewitt mercury light'. This was so striking that on many occasions, while going through the streets, she was advised to go home at once,—people believing she was dying. Physical examination was, however, negative, except for the remarkable discoloration of the entire body. The heart and lungs were practically normal. The patient was observed for some weeks, and as the ordinary blood examination failed to reveal any polycythemia or other abnormality to account for the condition, a tentative diagnosis of sulph-hemoglobinemia was made, and toward the end of Nov 1909, the patient was sent to New York for consultation and a spectroscopic examination of the blood. When seen at the Vanderbilt Clinic, the patient presented the same characteristic appearance of deadly cyanosis as did the two cases seen in London. The almost complete absence of signs of impaired heart and lungs was confirmed . . .

"A spectroscopic blood examination is in reality the simplest of procedures, and requires but little technical ability. The blood is drawn from a vein, or if this is not allowed, a few drops from the finger or ear will usually suffice. It is immediately diluted with twice its volume of distilled water, before clotting has taken place, and is thoroughly shaken. After the fibrin has separated, the solution is filtered several times through one filter paper, and the clear solution is looked at through a spectroscope—a simple and inexpensive instrument. The solution is then diluted drop by drop with water, until the red color stands out clearly. If there is a black absorption band in the red, either methemoglobin or sulph-hemoglobin is present. If such a band persists after the addition of a drop of dilute ammonium sulphide, the pigment is sulph-hemoglobin; if it disappears, it is methemoglobin. For a critical examination, nothing further is required. The recognition of these diseases is of especial importance from the standpoint of prognosis. If undiagnosed the patient's appearance suggests immediate dissolution when recognized, a most hopeful prognosis as to life can be given, though the complete recovery may, as in the present case, be a matter of weeks or months."

No method of treatment has yet been devised which immediately benefits the case,—or indeed, which shows material benefit, after several weeks of treatment. Extended research will be necessary to ascertain the causes of, and consequently the treatment for, this disease.

Medico-Psychological Association, American. The 56th annual meeting of this society was held at Washington during May 1910, when several papers were read. Among the more interesting were 'Brain Findings in Dementia Præcox,' by Dr E. E. Southard; 'Immunity in Relation to Psychiatry,' by Dr John G. Fitzgerald, of Toronto, and 'Some Suggestions on the Psychology of Superstition,' by Dr J. B. Dresslar.

Meningitis, Cerebro-Spinal. This disease has, in the past, proved almost universally fatal in all cases, especially in young children under three years of age, whom it attacks very largely. Dr. Simon Flexner, of the Rockefeller Institute (q v), has lately discovered a serum, however, which he believes will cure this disease in the majority of cases. A paper on the subject, narrating the cure, was read at the New York Academy of Medicine; and the case was described in full by Dr Louis Fischer, of the Sydenham Hospital, who employed the serum.

The process employed by Doctor Fischer was to inject a quantity of the Flexner fluid into the right ventricle of the brain, the intercranial cavity being aspirated and as much fluid as possible being drained off. The cavity was then washed with a normal salt solution and the serum again injected. Lumbar injections were also made,—the result being a rapid improvement in the condition of the infantile patient. The infant, which, in this case, was two months old, was cured after seven weeks' treatment, and its condition, and the termination of the treatment, was that of a normal child enjoying the best of health.

It is too early, as yet, to speak of this serum as a cure for the disease; but excellent results have been obtained in many cases in which it has been tried, and, whereas before, practically every case proved fatal, under the present treatment, the mortality has fallen to about 16 per cent of those treated. It is now being tested on a large scale in various European clinics, with favorable results, and the hope is expressed that, with improvements in the serum, an effective cure will be placed in the hands of physicians for combating this fatal disease.

Mennonites. An Evangelical Christian denomination taking its name from Menno Simons (1492-1559), of East Friesland, who successfully organized the dispersed Anabaptists in Holland. In the United States the beginning of Mennonite bodies, which now number 12, was at Germantown, Pa., in 1683, where the first house of worship was built. In all of its branches the Church had in 1909 a membership of 54,798 and 604 churches, and 1,006 ministers, divided up into Mennonites proper, with 220 churches, 346 ministers, and 18,674 members; General Conference, 11,661; Brethren in Christ, 2,801; Reformed, 2,079; Amish, 7,640; Old Amish, 5,013; scattering bodies, 9,030. Foreign and home missions have been established in the past few years. Educational institutions at Elkhart, Indiana, Newton, Kansas, and Bluffton, Ohio, are flourishing. *The Herald of Truth*, published at Elkhart is the leading publication and official organ.

Mental Science. See PSYCHOTHERAPY.

Merchant Marine. See MESSAGE, PRESIDENT'S, TRADE.

Mesopotamia. See TURKEY.

Message, President's, 1910. The message of the President to Congress, 6 December was conservative in character, and in its demands for reformation or new enactments, very moderate.

Arbitration.—The settlement at the Hague of the Fisheries Question between the United

States and Great Britain, and of the Orinoco Steamship Company's difference with the Venezuelan Government, was warmly lauded by the President. In the case of the first-mentioned dispute, it was pointed out that its adjustment opened the way for satisfactory arbitration in other international matters, to the settlement of which the Fisheries Question was a stumbling-block, since there was no precedent under the general treaty of arbitration of 4 April 1908 until said question was decided. In other words, its settlement designated the means of diplomacy to be used in future.—The Hague Conventions. The case of the Orinoco Steamship Company, also, affords in its solution a basis of operation for future arbitrators in like matters pertaining to the United States.

Europe and the Orient—The President referred to the amicable adjustment of the complicated Balkan affairs, and to the recent upheaval in Portugal. He mentioned the gratifying results from the efforts of Secretary Knox in concluding the terms of a United States loan to China, toward Manchurian Railways, and of another loan to the same Government from an association of American bankers to be expended in reforming the currency of China. The latter loan amounts to \$50,000,000. The peaceful conditions in the Orient, where American citizens are guaranteed freedom and liberty, and the manifest desire on the part of Chinese and Japanese for fullest representation in affairs of government, received the favorable comment of Mr. Taft.

Latin American Independence and Politics—The message commended the spirit of friendship that prompted Argentina to make contract for the construction of big battleships with United States shipyards. The downfall of the strife-promoter of Nicaragua General Zelaya, and the prospects of continued peace in that country; the cooperation of United States capitalists with Honduras in its time of financial stringency; the presence of embassies from these countries at the centennial of Argentina, Chile, and Mexico; and the results of the fourth Pan-American Conference, at Buenos Ayres—viz, the signing of conventions affecting trade marks, patents, arbitration of money claims, etc., all were considered of sufficient importance to United States, to be dwelt upon in the President's Message.

Reciprocity and the Tariff—The regulation of the tariff as affecting Canada, Mr. Taft pointed out, both in the methods of kindness used and in the end reached, was a blessing to both countries, and promised a more unrestricted and profitable intercourse between the "sister countries" hereafter. By punishing discriminating countries and favoring unbiased markets abroad, it was lucidly explained, the United States is, under the present tariff system, obtaining the best results. Mr. Taft resisted the charges against the Republican Government of undue discrimination in favor of wealthy manufacturers in this country, and referred to the forthcoming report of the Tariff Board which has charge of the proper and equitable application of the tariff, and whose work is chiefly to decide how far home industries should be protected. Schedule by schedule the work would have to be prepared.

Trade and the Merchant Marine—For the enlargement of the country's trade, Mr. President declared that American banking houses should be encouraged to establish branches abroad, and that the merchant marine should be made more effective in the distribution of American goods, that these vessels of commerce should be sufficiently numerous to provide against the contingencies of war, to provide for the men-of-war, and to discourage the attempt of any nation against United States trade. He would have more consular representatives in the world, and support existing consuls. Mr. Taft protests against the too rigid exclusion of foreigners from the land.

Army Officers—That the army protecting our country should be so well equipped with efficient officers as to justify sudden and enormous enlistment of volunteers, undisciplined, was emphasized in the message of 6 December. A commission should be delegated to ascertain and prospectively enlist the latent fighting force of the country, to provide against possible war, says the President, and new officers should be created. But he would have coast fortifications consume a minimum amount of national funds, which should be appropriated, as far as possible, for Philippines and Hawaiian harbor works.

Finance and the Currency—The estimates for the coming year were set down in the Presidential report as follows: Government expenses, ordinary (including appropriations for public buildings, rivers, and harbors, and the navy building programme), \$630,494,013 12, being \$52,964,887 36 less than the outlay for 1910-11, and \$5,574,659 39 less than the original estimates submitted by the Treasury for 1911. To offset this expenditure, the Treasury estimates receipts for the coming year at \$680,000,000,000, leaving a probable surplus of ordinary receipts over ordinary expenditures of about \$56,000,000. Panama Canal statistics not included. The President urges professionalism in legislation, and particularly affirms his belief in experts as a national safeguard against foolish and inadequate law-making. He makes his application of the principle involved in the plea for a more efficient currency, and seeks to encourage a thorough investigation of world money systems by specialists, looking to the betterment of United States financial prospects and the same regulation of our money matters.

Customs and Judicial Reforms—The President in his message deprecates the obsolete methods of handling the customs, in vogue even yet to the detriment of the country. The work of reformation has been successfully carried on recently, more than \$10,000,000 having been already saved at the port of New York alone; but the fact that the collection of \$1 in revenue at York, Maine, cost \$50.04, and at Alexandria, Va., \$122.49, are specific examples of the enormity of customs extravagance, and arguments in favor of its speedy rectification. Mr. Taft advocates a vigilant cutter service and the watchfulness of traveling agents of the Treasury Department, as preventatives of the smuggling evil. He also avers that bank failures might be rendered impossible by the simplicity of effective inspection. The President's message inveighed against the unjustness of injunctions, and called for the passage

of the Injunction Bill, recommended at the previous session of Congress. He mentioned the satisfactory proceedings conducted against "bucket shops," whereby hundreds of millions of dollars were saved the people of the United States, and recommended "a general law providing for the incorporation of industrial and other companies engaged in inter-State commerce." The use of the Supreme Court as an instrument of power against the poor man and for the protection of the rich, rather than its use in interpreting the law and establishing precedents, was loudly decried; and it was made apparent that the President considered the chief judicial power of the country above the trivial differences that ought to be adjusted in minor tribunals. It was recommended that the salary of the Chief Justice of the Supreme Court be increased to \$17,500, that of the Associate Justices to \$17,000, of the Circuit Justices to \$10,000, and the District Judges to \$9,000, for the reason that men in such responsible positions are entitled to liberal treatment at the hands of their beneficiaries.

Law Enforcement and the Civil Service Law—Mr. Taft declared his belief in the good intentions of the corporations and trusts of the country, and that the nation should not undertake radical prosecutions and amendments of persons and laws, until it was evident that existing laws were being again transcended by said combinations; that the rules already established by legislation for the government of trusts and other combines, should be given a chance to prove efficient or abortive, and that the people of the country should rest until new laws were rendered necessary by infringement of the old. That members of the civil service should be superintended with a view to their promotion and greater value to the Government, was pointed out in the message. It was recommended that the Executive be given the power to include in the classified service all local officers under the Treasury Department, the Department of Justice, the Post Office Department, the Interior Department, and the Department of Commerce and Labor; that the confirmation of the Senate should not be henceforth required; and that the civil service employees should be guaranteed positions on conditions of good service, which would increase their value to the country.

Postal Banks and Railroads—Postal Banks were to be established in some of the cities and towns on the 1st of January, and to be gradually extended throughout the country. The deficit of the Post Office, the message read, would be entirely wiped out in the coming year. The appropriations for last year over the estimated receipts were put at \$17,500,000, but the excellent work of new officials reduced the estimate to \$11,500,000. Certain necessary changes in the Railroad Law were called to the attention of Congress, but not urged for its action in the 1910-11 session. The President favored a bill ordering the inspection of boilers by the railroads themselves, and the protection of employees, he declared, should be looked after. Mr. Taft advised that appropriations be made the Interstate Commerce Commission for the purpose of its valuation of all the railroads, which would be valuable for many purposes, especially in the event of any limiting enactments. The guilty parties

in connection with forged or fraudulent bills of lading should, said the President, be punished by fines and imprisonment, and the evil, against which foreign bankers have complained so vociferously, stamped out.

Corporation Tax—To quote the President: "As an income-producing measure, the existing tariff bill has never been exceeded by any customs bill in the history of the country." No resistance has been offered to the income tax by trusts. The newly-inaugurated system affords opportunity to the Government of investigating "graft," moreover, all corporation returns, and stock manœuvres, are open before the critical eye of Government representatives, and the public in general, although not published, as originally demanded. Stockholders are given wide privileges of examination.

Panama Canal—Mr. Taft, in his message of 6 December, made the statement that to expend all the money possible on the Panama Canal, and complete the work as rapidly as possible, was to save money to the United States Government. The estimates for the Canal are \$56,920,847 69, including \$19,000,000 for fortifications. The country has made appropriations toward the Canal aggregating about \$400,000,000. The President declares we should not expect the tolls, for a good many years, to suffice for the payment of the interest; that the benefit to the United States can not be measured by a return upon the investment. He thinks \$1 per ton net would be a proper charge. This would provide a gross income of \$7,000,000, or \$4,000,000 yearly in excess of the estimated cost of maintenance. President Taft expressed his belief that the work would be completed by 1 Jan 1915, provided no serious obstacles hamper construction. Of that nature was a recent dirt-flow of about 30,000,000 cubic yards in volume, the cause of which Doctor Hayes of the Geological Society was sent by the Government to ascertain, and which is being provided against. The fortification of the Panama Canal is being, and was in the message of Dec 1910, ardently defended by the President. One of the strongest arguments advanced in favor of fortification lies, as pointed out, in the fact that the United States contemplated and undertook the gigantic project for the specific purpose of increasing the effectiveness of the navy.

Labor Laws and Immigration—The misapplication of the Labor Law by those who would evade its obligations, was made the subject of a paragraph in the Presidential message. Mr. Taft wanted the law amended so that there would be no loop-hole whereby employers of workers on Government battleships in private ship-yards might escape, leaving the representatives of labor to fill in over-time. The President asked for the right to determine the specific application of the law in cases of emergency. That the "employers' liability" system was unsatisfactory, was a contention of the message, and the President recommended that an invitation be given the International Congress on Industrial Insurance to meet in Washington. Referring to immigration, he discouraged the extension of buildings in New York for the accommodation of immigrants, and looked with favor upon their reception at other ports and their segregation to various parts of the south and west of the country.

He would discourage the separation of families, also.

Timber Monopolies and Conservation of Resources.—According to report of the Commissioner of Corporations, covering an area of more than 80 per cent of the private-owned forest-lands of the country (the message has it), one-half of the timber is owned by 200 persons, 14 per cent is owned by three corporations; and that there is a very extensive interownership of stock—a portentous circumstance. The preservation of the seals of the Pribiloff Islands is being looked to, the value to the government of the pelts being \$450,000 in Jan. 1911. Aside from the recommendations of his address on conservation at St. Paul in Sept. 1910, the President, in his message, supported the principle of leasing coal-mines—2,500 acres of surface as a maximum to one individual or other lessee; he advised the same regulation of phosphate lands; he enumerated rules for the controlling of oil-fields or gas-fields, the period of lease (among other restrictions) to be shorter than that governing coal lands, he outlined the manner in which water power sites should be leased—and that directly by the Federal Government; and he upheld the further reservations of forest territories in Oregon, Washington, Idaho, Montana, Colorado, and Wyoming, and would have restrictions upon the Executive, working contrarywise, removed.

Alaskan Government.—President Taft thinks that a commission of government, similar to that of the Philippines, should be constituted in Alaska, where the population numbers about 50,000. The commission would insure the protection of individuals against "exploiting interests." Mr. Taft thinks appropriations for the purpose of Alaskan railway construction would encourage puerile habits in the inhabitants, who will soon themselves be equal to the demands of civilization.

Sundry Recommendations and References.—The President controverted certain magazine arguments relative to the postage rates, and recommended a higher rate per page for advertising matter than for reading. In respect to the navy, he advocated the reduction of the age of officers, and also the establishment of a naval base at Guantanamo in the West Indies. He spoke of national extravagance, and suggested as a remedy the responsible coöperation of civil service employees, and general vigilance. He would put a ban on the manufacture of phosphorous matches, as dangerous to the lives and happiness of many. He sanctioned the need of a National Bureau of Health, and regretted the opposition its advocacy stimulated. The National Parks, now extensive, the President would have under control of a Bureau. Mr. Taft smiles upon the prosperity which has smiled upon the United States during the past year. The products have exceeded those of last year, the message from the President shows, by \$305,000,000. Mr. Taft approves of a negro exposition, and recommended on 6 December, that steps be taken in the preparation of such, to commemorate the emancipation of the slaves in Lincoln's time.

Messina. City of Sicily, chief town of the province of Messina, totally destroyed by the most disastrous earthquake that ever occurred

in a civilized country on 28 Dec. 1908. At the time of its destruction, Messina was a city of some 160,000 souls, and of these probably about one half perished. Messina was one of the most ancient and important cities of the island, charmingly situated on the Strait of Messina, encircled by a zone of abrupt conical rocks. It had several fine squares, and wide lava-paved streets. The harbor of Messina is about 4 miles in circumference. The trade of Messina lay chiefly in silk, oil, wine, coral, fruits, linseed, and fish. Its cathedral dated from 1098. Its university had nearly 700 students and possessed a valuable library collected by the Jesuits, originally known as Zancle. The town was captured 493 B. C. by Anaxilas of Rhegium, who renamed it Messene. It afterwards played its part in the remarkable political vicissitudes of Sicily, passing in turn under Athenian, Carthaginian and Mamertines. It was the cause of the First Punic War and was very prosperous under the Romans. In 829 A. D. the Saracens captured it, and they in turn were expelled by the Normans, 1072. In the 15th century, a famous school of painting flourished there. Messina is being rebuilt by the Italian Government.

Metabolism. See RESPIRATION, CALORIMETER.

Metallography. The examination under the microscope of a highly polished metal surface that has been submitted to the action of a reagent. Minerals are tested by this method. It causes the differentiation of diverse constituents, some being attacked while others are not. The first requisite in the test is to cut the sample. This is done with a saw in the case of most metals and alloys. Precaution should be taken to prevent the alteration of the substance during the operation. The heating of the piece must be avoided. This is accomplished by running the saw at slow speed and flooding it with soap and water and oil. The ordinary annealed steels, bronzes, brasses, and many common alloys are sectioned in this way. Others are cut with a very thin carborundum grindstone. The polishing comes next. It includes roughing down, grinding with emery and finishing. The roughing is done to dress the face that is to be observed. For this purpose there is used an emery or carborundum stone, revolving at variable speed according to the metal under examination. There are from 800 to 1,000 revolutions a minute for soft steels, unhardened bronze and brass, i. e., for all alloys in such a state that slight heating is not objectionable. The speed of the wheel is lowered and kept thoroughly wet for tempered steels and in other cases. The grindstone is mounted on a frame and operated by foot power or mechanically. The metal must not be pressed too hard against the face of the stone in order to avoid a deep hardening effect. It is necessary to remove the skin in order to avoid the slightest inaccuracy of result. This is done by rubbing the roughed down samples by hand or with coarse emery. The finishing depends almost entirely upon the cure given the preparation of the materials used in this final polishing operation. Powders with grains of very uniform size must be specially prepared. Ammonia-alum is pulverized and calcined. The alumina thus obtained is ground in a mortar to break up the lumps which have formed. It is then washed several times with

an 0.001 to 1 solution of nitric acid, next with distilled water and finally with water to which 1 or 2 cubic centimeters of ammonia per litre have been added. This causes the removal of the various salts, especially carbonate and sulphate of lime, which might be precipitated with the alumina. A slight excess of nitric acid may remain, but it is neutralized. The alumina suspended in water is next put into a receptacle of 1 or 2 liters capacity and allowed to rest a certain time. The large grains precipitated are rejected and the supernatant liquor siphoned off. This is allowed to rest successively for 2 hours, 4 hours, etc., and at the end of each period the liquor is siphoned off, while the corresponding precipitates are carefully preserved separate, each one being finer than the preceding as the number of decantations increases. There has been an apparatus designed by LeChatelier where commercial 2 minute emery is sifted through 150 mesh and then through 200 mesh and that portion is collected which passes the first screen and remains upon the second. The finest grade of commercial emery for the finer polishing powder or putty is washed by an ascending current of water with a speed of about 1 millimetre per second and the portions carried off by the current are collected for use. There has also been invented a speed process for the practical conduct of this experiment. The utilization of polishing materials finished by a polishing with alumina, is conducted upon rapidly revolving discs. In ordinary shop laboratories, they are made of thoroughly seasoned wood, covered with a flat disc of zinc, over which thick cloth is stretched. The polishing is begun with 2 hour alumina, followed by 4 hour, and with still finer grades if necessary. The alumina is then suspended in water in a spraying apparatus, thereby securing an excellent distribution of the polishing power. The most delicate matter to regulate in microscopic work on metals is light. This is usually done by trial, a large number of movable pieces being used. M. LeChatelier has sought to reduce this experimental effort to a minimum and give each element an exactly determinable effect. These elements are two variable openings and the variable position of a single diaphragm D so placed that the opening of the diaphragm controls the angle of the luminous beam which falls upon each point of the sample. The angle must vary with the nature and quality of the objective. The position of the diaphragm controls the average inclination at which the beam falls upon the sample. For clearness alone this direction should approach normal, but it is necessary to depart from this in order to reduce the amount of light reflected by lenses to the eye of the observer. Microscopic method has replaced chemical analysis advantageously and with sufficient closeness of approximation in such alloys as those of lead and antimony employed for bullets, accumulator plates and anti-friction metals and of silver and copper used for coin and plate. According to a paper read by Dr. William Campbell before the Canadian Mining Institute, the latest development of metallography is in its application to economic geology. It has rendered possible our distinguishing more easily of the relative ages of the various opaque constituents of ore bodies than can be done by hand specimens or in the petrographic slide when dealing with complex and compact masses. The ordinary specimens

from Butte, Montana, are composed of iron pyrites with more or less copper. Under the microscope, the pyrite is clearly the oldest constituent. It has been broken up and fractured, then eroded by solutions. Bornite and chalcocite are deposited in the interstitial spaces. The chalcocite is apparently younger than the bornite for it cuts it in places. The silver deposits of Cobalt, Ontario, have been studied in that way. The first mineral to crystallize out in the vein was smaltite, followed by niccolite, for cubes of smaltite are found embedded in niccolite. Both the niccolite and the smaltite show signs of disturbance and are cut by veins of calcite. Nickeliferous pyrites are the subject of dispute. Some hold that nickel replaces the iron isomorphously. From examinations made, it is shown that the nickel occurred as pentlandite. Chalcopyrite usually occurs also. The following order of success holds good pyrites, pentlandite, and chalcopyrite. The processes of decomposition and secondary enrichment can be studied metallographically. Another important line of work is the study of certain complex mineral species to determine their constitution. It is possible to ascertain whether a mineral owes its peculiarity of formula to a definite combination or to the presence of foreign bodies as in the case of a mechanical mixture. In the majority of specimens examined there is found more or less admixture of foreign matter. Chalcopyrite includes chalcocite or pyrite, some times even galena. Tetrahedrite includes quite a number of other minerals. Steel galena when examined is found in many cases to owe its fine structure to the presence of a second mineral. Each grain is surrounded by a fine film of quartz in one case, calcite in another, tetrahedrite in another, blend and so on. The galena deposited, then crushed and the second constituent then deposited in many cases.

Metallurgy. The electric furnace is developing a new practice in metallurgy as well as presenting new conditions to the steel maker. Thus far the foreign steel maker has manifested most interest in it, but the time is not destined to be far distant when the steel plants on this side of the Atlantic may take up the electric steel furnace as one of the important innovations in that industry. The furnace has been shown to rapidly remove oxides, sulphur, and phosphorus, things considered undesirable in steel. Much progress has been made during the past year with the electric furnaces as applied to steel production, commercially and metallurgically. The furnaces used were of the types developed by such prominent workers as Stassano, Keller, Heroult, Gerod, Kjellin, Colby & Rochling, and Rodenhauer. The largest of these furnaces in point of tonnage are those of the Heroult type. For some time, one has been running at the South Chicago Works of the Illinois Steel Company and another at the Worcester Works of The American Steel and Wire Company. These furnaces have been designed to handle from 12 to 15 tons at a heat. One of them working well will handle about 12 heats daily, with a total daily production of 150 to 180 tons. All electric furnaces are basic lined. As a component of the lining mixture, a proportion of tar or pitch is used. It is possible to obtain good results when this is baked in not too slowly. The electric furnaces differ in this respect from other steel-making furnaces. The

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electrodes are the chief difficulty with furnaces of the electrode type. They are made of carbon and that material presents unusual difficulties of manufacture with the increase in size. Here is an experiment that illustrates the value of the electric furnace. There are works in a Luxembourg district where hot Luxembourg metal is charged into a 4-ton electric furnace with 25 per cent scrap. But one furnace is necessary to remove the carbon, sulphur, and phosphorus. The hot metal contains 1.8 phosphorus and 0.20 per cent sulphur, the final product being soft steel for castings containing 0.1 per cent and below of carbon with sulphur and phosphorus below 0.02 per cent. A very important work of the electric furnace is the production of pig iron. This is going on at present at the Domnarivret Works in Sweden and at Heroult on the Pitt River, Shasta county, California, where the Noble Electric Steel Company has built a plant for mining magnetic ore and limestone on the premises, together with a complete plant for making wood charcoal and recovering the by-product. The furnace in Sweden was designed by Gronwall, Lindblad, and Stalhane. The California electric furnace is the result of a series of experiments by Prof. D. A. Lyon of Stanford, the metallurgist in charge. The type was developed in that way. The furnace has six carbon electrodes. Much difficulty was encountered with them. The furnace was started in operation 13 December, and the next day there was made a tap of eight tons electric furnace pig iron. The furnace has since been tapped regularly and no difficulties have arisen. We are assured, however, that the fact of its being possible to produce pig iron in an electric furnace must not be taken as a menace to the existing method. An apparatus has merely been devised suitable to a certain condition where the older method in the production of pig iron would not be found practical. It is said that the application of the electric furnace process will find its growth and development in certain restricted localities where the conditions favorable to it exist, without invading the districts where fuel-fired furnaces are utilized. Some of the product of the Noble Electric Steel Company has already been used for castings at Redding, California. Another very important advance in metallurgy is what is known as the American ingot iron. This is one of the most interesting and important products of iron metallurgy. It comes from an open hearth steel furnace. The ingot iron in point of chemical composition and mechanical properties is very much like the wrought iron. It differs from steel in having its carbon, manganese, and silicon contents reduced to small fractions of the amounts found in ordinary soft steel. A typical sample shows the carbon and sulphur each reduced to 0.02 per cent, the manganese to 0.01 per cent, the oxygen to 0.03 per cent, and phosphorus and silicon to slight traces. The tests indicate an ultimate tensile strength of from 47,000 to 49,000 pounds per square inch. The prime quality of this ingot iron is the resistance to corrosion. The plan of the manufacturer has been to produce a low carbon steel, as soft and pure as feasible. It is produced on a large scale at the open hearth furnace. Its rust resisting qualities are equivalent to those of the best wrought iron. The same basic lined furnace is used in the process as in the regular open hearth process. The same charge is practically made,

but the boiling is continued to an excessive degree, in order to oxidize the impurities more thoroughly than in ordinary steel practise. The usual ferromanganese recarburizer is omitted and instead an addition of ferro-silicon or an equivalent substance is made for the purpose of purifying the bath of its entrained oxides. Aluminum is finally added to the ladle in order to carry out the gases dissolved in the fluid metal. The maintenance of an active basic slag, continuance of the boiling process until all foreign elements in the iron are practically reduced to zero, the keeping up a sufficiently high heat for complete fusion, the active boiling and the treatment for removing oxygen and other gases by the addition of purifiers are the essentials of the melting process. Ore or milk scale are added to oxidation which with the absorption by the basic slag aids in the removal of the impurities. Another important discovery in metallurgy is the oxyhydrogen blow pipe. This process is used for cutting iron and steel. It has been adopted in Europe on an extensive scale. The process is both rapid and inexpensive. An armor plate of 160 millimeters (6.3 inches) thickness can be cut for a length of 1 meter (39.37 inches) in 10 minutes. For the same length, the cutting of a 15 millimeter (0.59 inch) plate requires less than 5 minutes and the cost is not over 150 francs (\$30). There were certain portions of the main longitudinal beams of a locomotive cut out at the shops of the Northern Railroad Company without making it necessary to dismount the locomotive. The cutting was done in two places. By the old method, this operation would have taken at least three days, but by the new blow pipe process, the work was finished in 25 minutes at a cost in gas of \$0.80. Experimentation in ore has been a fruitful field in metallurgy. Where it is possible to prepare the ore dry, a high extraction can be obtained and a purer article produced by magnetic separation of nearly all tungsten ores than by wet concentration. But the magnetic separation is not to be applied to scheelite or other tungsten minerals which do not contain iron. The successful wet concentration of the common forms of the ores of tungsten is a difficult undertaking, but the mills claim to save 70 or 80 per cent and in some cases over 90 per cent. One of the most annoying features is the constant liability to introduce either accidentally or through natural causes, the heavy sulphides of iron, lead, zinc, etc., as well as the heavy oxides of tin, magnetic iron, arsenical sulphides, fluorspar, carbonate of lead, and other impurities, all of which have a detrimental effect upon the price of tungsten concentrates. The application of the magnetic system of removing tungsten from vein matter absolutely does away with the chance introduction of detrimental elements. The magnetic product will not alone command the higher price, but in most cases the magnetic separation result in a largely increased recovery over that of wet concentration. It is only during the last 20 years that the electro-metallurgical industries have grown. There was one prior to 1886. It had to do with copper refining. The industry was carried on in a few works and the scale of operation limited. The electrolytic copper-refining industry at the present day is second only in importance to that of copper smelting and over one-half of the world's production of copper

is submitted to the former process. Other important electro-metallurgical industries are the manufacture of aluminium, calcium, carbundum, ferroalloys, and sodium. The production of aluminium has increased from 85 tons in 1889 to 12,000 in 1906. Its manufacture is being carried on in a number of works controlling over 84,000 horse power. The largest plant is that of the British Aluminium Company in Switzerland, the horse power of which is 45,000. The works of The Pittsburg Reduction Company at Messena, N. Y., have 12,000 horse power. The electrolytic method is being used in the refining of gold and silver. The Moebius process is being used for refining silver and the Wohlwill for gold. In the Moebius process, a dilute solution of silver nitrate containing free nitric acid is employed as electrolyte, while in the Wohlwill a solution of gold chloride is utilized. The Philadelphia and Denver mints are equipped with electrolytic parting apparatus. Electrolytic baths are installed at the mint in San Francisco. Calcium carbide is obtained by heating lime and coke in an electric furnace. There are now between 60 and 70 works devoted to this industry and the aggregate production amounts to between 90 and 100 tons per annum, valued at \$5,000,000. The United States, Italy, and France are the largest producing countries. They are also the largest consumers of carbide for acetylene-generation purposes. One of the latest electro-metallurgical products is calcium in the metallic state. The metal is produced by the electrolysis of fused calcium chloride and fluoride with a rising cathode which just touches the surface of the fused electrolyte. The method has been adopted to prevent the re-solution in the molten electrolyte of the calcium deposited at the cathode. The temperature of the bath is kept at about 670° C. and the metal is obtained in the form of a regular rod, made up of a series of buttons, fused together. Another metallurgical product is diamantine which is obtained by heating alumina with small quantities of silica to a high temperature in an electric furnace. Finely powdered and mixed with clay and water, the new material is said to form a useful wash for the inside linings and walls of furnaces exposed to high temperature.

Metals. The mining situation was troubled throughout the United States during 1910 although the production of metals was uniformly greater than in earlier years. The activities of the postal authorities in weeding out the mining stock frauds had the effect of increasing investment in legitimate mining projects and gave a healthier tone to all the mining camps. The postal authorities showed that only a very small proportion of the many millions gathered by mining promoters who advertised widely, ever went into mines. But actual investors, acting on the advice of competent engineers, were inclined to invest in mines to a constantly growing extent.

Copper. The opening of a number of large mines and the dividends paid by some of the more successful copper mines had the effect in the past few years of making speculation on copper stock extremely easy. The result was an unwarranted inflation in values and the issuance of stock beyond the legitimate earning capacities of many mines. The effect was that when the purchase of these stocks fell off in

1910 there was a general depression in copper, although the consumption was increasing enormously and the production was more than keeping pace with it. The depression was in large part due to over speculation.

The most notable point in the copper situation has been the development of the "porphyry mines," which have been producing on an unprecedented scale. These ores are comparatively low grade, but are capable of rapid handling. Nevada-Consolidated, was treating 8,000 tons a day in 1910; Utah Boston, 20,000 tons, and the new Ray Consolidated opened with 8,000 tons a day. These works have cost millions, but the stock has in most instances passed from the hands of the original investors to speculators on the stock exchanges.

Domestic deliveries of copper were 766,000,000 pounds for 1910 as compared with 705,000,000 pounds in 1909. During the same period the domestic consumption was 700,000,000 pounds, the largest on record. Manufacturers on the whole had less copper on hand at the end than at the beginning of 1910. Notwithstanding the great output in 1910, which kept the market unsteady, the visible supply at the beginning of 1911 was only 315,000,000 pounds as against 386,000,000 pounds of the year previous. Invisible stock, held back to prevent the market from being overloaded, can only be estimated. Their aggregate is, however, small in comparison with the visible supply. Probably it has not been materially decreased. On account of the apparent over production due to the opening of new mines, certain large copper interests announced curtailment in production of 15 per cent in July, 1910. In spite of this curtailment, the annual production was not affected. The copper market fluctuated during the year in a narrow compass, between 15 5-8 cents and 12 1-4 cents.

Iron. The production of iron during 1910 was double that of 1900, approaching 27,000,000 tons. Many mills were closed towards the end of the year and the United States Steel Corporation operated at about 55 per cent capacity. Independent concerns have, however, been operating on a more general scale. The capacity of all the iron furnaces at the beginning of 1910 was 36,000,000 tons, and at the end of the year these were working only at 60 per cent capacity. Bessemer pig-iron was \$19.90 at the beginning of the year and fell to a little more than \$15.50 in December. At the beginning of the year 1911 the prices were lower than at any annual average since 1898, except 1904. It was, however, greater than during any of the years between 1893 and 1898.

The policy of the United States Steel Corporation is not to cut prices to stimulate purchasing but to wait for prices to revive. Independent producers, however, cut the prices and stimulate the market. The portion of the Steel Corporation's councils, known as the Carnegie element, has a similar tendency. In the early part of 1909 it cut prices and led to a great renewal of business activity, causing the lesser companies to overproduce until the summer of 1910, when they realized that the market had been overstocked.

Zinc. On account of the low capitalization necessary to opening and operating zinc mines, the market constantly fluctuates in regard to this metal. This industry has not been dealt in by the larger financiers and the market is in

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consequence unfettered. Mines open or close promptly in response to the demand. In 1909 they had a great boom similar to that in the copper and iron industries and the mines were worked to capacity, bringing on an overstocked market at the beginning of 1910. Prices fell steadily until June 1910, when the surplus having been largely used, prices again assumed a more nearly normal status. The zinc interests secured legislation under the Payne-Aldrich tariff act which they believed would protect them, but large supplies from American sources upset this calculation. Zinc production has been greatly cheapened in recent years by the use of natural gas, and more recently by soft coal. In the gas districts little preparation has been made for the use of soft coal to take the place of the rapidly passing gas wells, and there may be a shortage of zinc for a short time whenever several districts dependent upon gas happen to be derived of their fuel at nearly the same time. In Europe the zinc business has been skillfully handled, making large profits due to a combination among producers. An agreement is now in effect which will make the zinc business profitable for at least several years.

Lead—A syndicate of mine owners control the production of lead and fix a schedule of prices. This is not always held, however. At the beginning of 1910 there was a large unsold accumulation and the price raised to 470 cents by the syndicate could not be held in the face of independent producers, so that the market dropped to 430 cents in May. As soon as the independent surplus had been used the price rose to 440 and remained there until November when it jumped to 450. The production of lead on the whole is not increasing. No new mines have been opened in recent years and some of the greatest lead mines such as the Broken Hill in Austria and the Coeur d'Alenes in Idaho have been gradually used up. Nevertheless there has been no lack of lead and in Europe where combinations have been attempted, there has been no great success due to the competition.

Tin—During 1910 this metal maintained a market price well above that of 1909, due to a steady decrease in production. Malaya, which furnishes 50 per cent, has been falling off in recent years and no new mines have been opened to take their places. New fields are being developed in South Africa, but, meanwhile, there has been a notable shortage, which has caused the price to soar under the control of European speculators. There are no promising tin mines in America. Texas produced a few tons of the metal in 1910. But the United States is the greatest consumer, its importation in 1910 being nearly 40 per cent of the world's output. The tin plate and galvanizing works were uniformly busy, using more than 100,000,000 pounds.

Aluminum.—Only one company in this country, the Aluminum Company of America, produces this metal, and is protected by a 7 per cent tariff. Nevertheless there was a considerable importation from Europe in 1910. Prices ranged from 22 to 23 cents per pound. The trade in the aggregate was smaller than in 1909, on account of lesser activity in the automobile business.

Silver.—Towards the end of 1910 the price

of silver which had been about 50 cents an ounce for many months increased to 55 cents. No adequate reason for this could be given. Nowadays silver is produced largely as an adjunct to other metals and helps pay the expenses of operating mines, but only in the Cobalt district is it being mined independently of other metals. There it is very rich.

Gold—The appeal to avarice of speculators in gold has been considerably curtailed by the exposures of the mining fakes, but the production of gold has increased steadily. In 1909 the year's production of the United States was \$99,232,000, and in 1910 it had increased materially. In 1911 it will be greater by at least \$10,000,000 due to the opening of the Roosevelt tunnel draining the surplus waters from the Cripple Creek district. The annual production of Cripple Creek is now \$15,000,000, and this will be increased to \$25,000,000 in 1911. The district has produced so far \$300,000,000 in gold. Nevada has come to be the greatest gold-producing State, although less talked of than a few years ago. Much capital has been invested and large returns realized. The Goldfield Consolidated for the fiscal year ending 31 Oct 1910, reported a production of \$10,850,000 making it the biggest contributor of the year. All the Nevada mining camps have been producing steadily, the district about Seven Troughs attracting attention on account of new discoveries. In Oregon gold is being dredged on a hitherto unprecedented scale in the Rogue River valley. In Idaho and Utah the smelting has not been unusual. In the Black Hills district there has been a renewed activity following a cessation of mining in many sections. The most sensational camps have been in the Porcupine in Canada and northward towards Hudson Bay. Alaska's gold output for 1910 was about the same as 1909. The Fairbanks district on the Tanana produced \$4,141,407. Nome was second with \$3,576,584. Iditarod produced \$800,000. This is a new district, containing now about 4,000 people and believed to be one of the greatest gold districts in the North. It is expected to produce between \$5,000,000 and \$8,000,000 in 1911. Rushes were preparing for the spring of 1911 into the Kushkokwim, south of Iditarod.

Metals, Contagious Diseases of. Tin Pest—The scientist Erdmann in 1851, having observed an odd structural formation of the tin in some old organ pipes, brought the matter to the attention of the Royal Society at Leipsic and ascribed the change to the vibration to which the pipes had been subjected. But, in 1869, Fritzsche of St. Petersburg, having observed similar phenomena, proved by experiments the truth of the theory that the alteration in the nature of the tin was due to the action of severe cold. Other investigators studied the same subject, but the true nature of the alteration and the conditions governing it were not determined until the researches by Prof. Ernest Cohen.

The disease studied by Erdmann and Fritzsche, Cohen designates as tin-pest. The affected metal swells in spots, forming blisters from which small drops issue and hang. Later, as the disease progresses, the blisters enlarge and the metallic gloss gradually disappears. Sawing through affected metal has shown that the interior is affected last. When the entire mass

has been transferred it readily crumbles, and consists partly of fibrous lumps of varied sizes and partly of sandy powder. If a new piece of tin is cooled artificially, the modification shows first in isolated spots, spreading into blisters and later forms a columnar structure. Tin thus transformed by cold is distinctly gray, but the action of heat produces a striking change. Merely covering it with hot water causes the dark gray color to become much lighter, approaching the appearance of ordinary tin, and the specimen also decreases perceptibly in volume. If it is then cooled again below the freezing point of mercury, it becomes almost as dark as before heating. If modified tin is heated to the melting point, a considerable portion will remain oxidized. Upon solidification the molten portion assumes the appearance of ordinary tin and can be again transformed into the gray modification by bringing it to a low temperature. The specific gravity of ordinary tin is 7.28, while that of gray tin is 5.75.

Professor Cohen at first directed his attention to ascertaining the temperature at which ordinary tin is changed into the gray modification. Former investigations having differed widely, Fritzsche's experiments indicating that the alteration was reversible, it was concluded that there was a definite temperature at which the transformation might proceed in either direction. To determine this critical temperature Professor Cohen employed two methods: one electric, indicating the critical temperature to be in the neighborhood of 20 degrees C; the second method volumetric, based on the fact that the two forms of the tin differ in specific gravity, also indicating that the critical temperature must be in the neighborhood of 20 degrees C., careful determination proving it was exactly 18 degrees C., about 65 degrees F. It was also ascertained that the transformation takes place most rapidly at a temperature of about 48 degrees C. below zero, about 54 degrees F below zero. An interesting discovery was that a few particles, or "germs" of gray tin would hasten the modification considerably.

Wrought Metal Diseases—R. Von Hasslinger observed that the tinned-solder seams of an air compressor made of tinned sheet iron had been affected in such a manner that the solder had melted away in spots and assumed a crystalline structure. The tinned covering of the sheet iron had become granular and dull. The compressor having seldom been exposed to a low temperature, Von Hasslinger ascertained that independently of the temperature pieces of the affected metal would infect sound tin, crystallizing in minute wart-like bodies, and with the increasing distance from the center of infection gradually decreasing in rate of growth. These results indicating that the disease was not tin pest, Von Hasslinger concluded that it was due to crystallization, his experiments apparently bearing him out. Later experiments indicating that his theory was wrong, he published his observations, acknowledging that he was unable to account for them. His death occurring before he had concluded his researches, Prof Guido Goldschmiedt, of Prague, his teacher, suggested to Professor Cohen that he continue the investigation. After various experiments Professor Cohen did so, using as a basis these well-known facts; first that a metal which has

been subjected to a tensile or to a compression strain (wrought metal) has an electrolytic solution pressure higher than if it had not been subjected to mechanical forces, second; that several metals, among them tin, have a property of re-crystallization, that is, of exhibiting a growth of their individual crystal grains, more particularly at a high temperature. It is known that two specimens of wrought metal (in an electrolytic sense) are seldom absolutely identical, and wrought metal has a tendency to return to the condition of unwrought metal. Theoretically it is to be expected that an increase of temperature ought to strengthen this tendency which is slight at ordinary temperatures, also that the transformation would be hastened by inoculation with the form most stable under the particular conditions of the case. These deductions have been fully confirmed experimentally. Professor Cohen proved that the phenomena observed by Von Hasslinger arrived at structural changes wrought by the mechanical processes of manufacture. The wrought metal disease has been found to have affected other metals than tin such as brass and lead.

Meteorites. It is estimated that between 15,000,000 and 20,000,000 of meteoric bodies enter the atmosphere of the earth every year. The smaller ones are consumed in the passage through the air and descend to the earth in the form of meteoric dust but some strike the earth with sufficient force to bury themselves deeply. The largest one to attract attention in recent years appeared in the sky near Johannesburg, South Africa, 3 Oct 1910, lighting up the heavens and appearing to be half as large as the moon. The meteor it was calculated fell within 150 miles of Johannesburg. Its brilliance was equal to a naval searchlight at 50 yards and the astronomers in the famous Johannesburg observatory were nearly blinded by the sudden appearance of the meteor.

It is not possible to determine the size of this meteor but it was undoubtedly as large as, if not larger than, the famous Willamette meteor in the Museum of Natural History of New York. This meteor was found near Portland, Oregon, buried deep in the earth. It is 10 feet long, 6 feet, 6 inches high and 4 feet, 3 inches thick, an irregular mass, with many holes believed to be formed by the fusing of the metal during the flight through the atmosphere before striking the earth.

Interest in meteors has always been great, since they are believed to come from other worlds than our own, and the suggestion has been made many times that life may have first come to the world in a meteor. Lord Kelvin suggested that life may have come in this way from "a fragment of an exploded world," and Camille Flammarion, the French astronomer, postulates that these fragments pass through space with the germ of life dormant until it finds a condition in another planet favorable to its growth.

The most important contribution to this side of astronomical science was contributed during 1910 by Svante Arrhenius, the Swedish scientist who argues that life must have come to the earth in a meteorite. Spontaneous generation of life when conditions are ripe for it he holds to be as impossible as perpetual motion and accredits a meteor with having introduced life. Flammarion, in spite of his earlier comments,

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discredits this idea, pointing to the small size of meteors and questioning why, if these are chipped from large planets, no larger pieces have ever arrived. While expressing himself willing to acknowledge the poetic fancy in the idea he is compelled to say that there is no proof that meteors have ever come from inhabited worlds, or worlds upon which life has developed.

Arrhenius, however, has figured the distance the meteor would have to travel and the time it would take. Mars would be reached in 20 days, while Neptune would be a whole year away. To reach a planet circling about the nearest star to the sun, Alpha in the Constellation of the Centaur, would take 9,000 years. In spite of Arrhenius, however, the whole tendency of modern astronomical thought, based on research, is towards the belief that every planet at a certain period in its career has the possibilities of life developed in it in a sort of spontaneous generation.

Methodist Church, Primitive. An evangelical Christian denomination, growing out of Wesleyan English Methodism, with strong convictions of the efficacy of camp meetings and field preachers. Late statistics are churches, 104; ministers, 74; members, 7,346; annual conferences, 3; church property valued at \$500,000; value of school property, \$10,000; raised for home missions, \$10,000. The church has a theological school with about 50 students. The Church has considered propositions to unite with larger bodies of Methodism without coming to any definite plan which promised mutual benefit. Secretary of General Conference, Rev. J. Pronde, 44 Ruggler street, Providence, R. I.; Secretary Board of Foreign Missions, Rev. S. G. Nicholls, D.D., 2537 Lehigh avenue, Philadelphia, Pa.

Methodist-Episcopal Church. An evangelical Christian denomination. The Methodist Year Book states that the Methodist-Episcopal Church was organized at what is known as the *Christmas Conference*, held in the Lovely Lane Chapel, Baltimore, Md, in 1784; and that it was eight years later when the first General Conference was held. On 30 Oct. 1910, the John Street Church, New York City, the oldest Methodist Church in America, celebrated its 144th anniversary. The denomination has steadily grown in membership showing an increase for the year 1910 of 41,377 members, totalling 3,485,983; divided up into 30,304 churches, with an increase of 229; and a ministry of 19,828, recording an increase of 231. There are 35,595 Sunday Schools, with an increase of 617; teachers and officers, 373,298, showing an increase of 5,438; scholars, 3,510,870, with an increase of 131,816. Senior Epworth League, 14,303, increased by 261, with a membership of 604,258; Junior Epworth League, 6,253, a decrease of 107, and a membership of 235,076. Church buildings increased 229 in 1910, with an increased valuation of \$6,744,650, and a total valuation of \$180,821,057. Church parsonages increased 228, making a total of 13,830, valued at \$31,015,271. For ministerial support there was raised in 1910 the sum of \$15,600,176. Foreign and home missions of the church are extensive and increasing. There was available from all sources at the close of 1910 for foreign work \$1,156,794; for home missions and church extension the receipts were \$1,167,630

The Board of Foreign Missions (successor of the Missionary Society of the Methodist-Episcopal Church since 1 Jan. 1907), has charge of the great foreign field, including nearly all heathen lands and many European countries. The annual meeting of the board was held in Baltimore, Md, in Nov. 1910, and appropriations for 1911 were ordered amounting to a grand total of \$1,114,800. The Board of Home Missions and Church Extension met in New York City, Nov. 1910, and appropriated \$601,500 for white work in English-speaking Conferences, cities, colored work, Italian, Indian, Bohemian, Chinese, Finnish, French, German, Japanese, Korean, Norwegian, Danish, Portuguese, Spanish, Swedish, Greek, and Welsh. The educational work of the church embraces a broad field, and is in charge of the Board of Education, consisting of 36 members, equally made up of the clergy and laymen, as constituted by the General Conference of 1908. The object of the board is specifically to aid educational institutions, for which a general educational fund was to be provided; and the aid of worthy young people who were seeking an education, the purpose being "the securing of a well equipped force of men and women for the ministerial, missionary, evangelistic, and educational work of the church." The receipts from the beginning to 1910 amount to \$1,671,000. Since organization the board has aided 17,579 students. Of the total number aided, 991 are in the ministry; 204 are missionaries; 569 are teaching; 505 in other callings. Of the 2,269 students aided in the school year ending in 1910, there were 27 nationalities aided. The board has made an appeal for an increase of its endowment funds to at least \$250,000. The educational institutions are divided up into 46 classical, 54 colleges, 26 theological seminaries, and five female schools. The educational work among the colored people in the Southern States is under the direction of the Freedmen's Aid Society, which conducts 23 schools and colleges. The Women's Foreign Missionary Society collected during the year ending in 1910 the sum of \$743,990, an increase of \$52,028. The 41st annual meeting of this auxiliary of the church was held in Boston, Oct.-Nov. 1910. The record of the year's work was reported exceedingly gratifying, and marked progress in every department. The Woman's Home Missionary Society raised and expended during the year 1909 the sum of \$611,340. The 29th annual meeting was held in Buffalo, N. Y., in Oct. 1910, the reports showing steady advance. The auxiliary membership of the society is 114,000 and 26,000 circle members. There are 200 missionaries and 300 deaconesses at the front representing this society; also one field worker among young people and eight organizers of auxiliary societies and representatives of the work among women of the church. There are six hospitals connected with the Society, of which four are its direct property. The immigrant work of the Society extends along the Atlantic Coast and the ports of Seattle and Tacoma, Wash. There are two publication agencies, known as the Methodist Book Concern, and the Western Book Concern, from which are issued the extensive literature of the Church. The *Christian Advocate*, a weekly, *World-Wide Missions*, monthly, and *Methodist Review*, bi-monthly, are the leading official periodicals. The conference of the church in-

METHODIST-EPISCOPAL CHURCH SOUTH—METRIC SYSTEM

cludes 15 missions, 13 mission conferences, 132 annual conferences. Some of the important events of recent years in connection with this church was the European Congress at Copenhagen Sept 1907; the meeting of the General Conference at Baltimore in May 1908, attended by 787 delegates, which abolished the six months probation period, changed the name presiding elder to district superintendent, elected William F. Anderson, John H. Nuelsen, William A. Quayle, Charles W. Smith, Wilson S. Lewis, Edwin Hughes, Robert McIntyre and Frank W. Bristol bishops, and adopted a resolution requesting the bishops to appoint a commission, consisting of nine laymen, to compile statistics and gather information regarding the support of ministers, to report at the General Conference in 1912; the celebration in 1909 of the African Diamond Jubilee of Missions, on the 75th anniversary of the sending of the first Methodist missionary to Africa, which inaugurated a movement to raise \$300,000 as a thank offering and special gift for enlarging the work in the foreign field, which, after a vigorous and enthusiastic campaign, was successfully completed in December of the same year. The *Year Book* for 1911 records the death in 1910 of its recent editor, Stephen V. R. Ford, Bishop Henry Spellmeyer, and Bishop Cyrus D. Foss.

Methodist-Episcopal Church, South. An evangelical Christian denomination, established in 1845, independent of the Methodist-Episcopal Church, separated by the slavery question. The Church has a membership of nearly 2,000,000, upwards of 16,000 churches, and over 11,000 local and travelling preachers. The annual conferences number 47. The receipts for Foreign missions in 1909 were \$375,909; *Home Missions*, \$286,838; for Church Extension, \$149,116; for the support of superannuates, \$226,521. Value of Church buildings (numbering about 14,000), \$37,864,452. There are nearly 5,000 pastoral residences owned by the denomination. There are over fifteen thousand Sunday schools with 120,861 teachers and officers, and 1,258,467 scholars. The Epworth Leagues are 3,951, with a membership enrollment of 141,928. The educational institutions include over 100 secondary schools, 15 colleges and one university. The college and university endowments amount to nearly \$500,000. The publishing fund amounts to about \$1,000,000 in net assets. Some of the important matters in connection with the denomination in recent years are. 1907—the organization of the Laymen's Missionary Movement; the uniting with two other Methodist churches at Tokio, Japan, to form the Methodist Church of Japan; the destruction by fire of the buildings of Centenary College, Cleveland, Tennessee; the death of Dr. Young J. Allen, for over 50 years representative of the Church at Shanghai, China; the death of Dr. John Matthews, one of its oldest preachers; 1908—the increase of nearly 60,000 members of church, and upwards of 45,000 in the Sunday-School; 89 new Epworth Leagues established, increasing the general membership by upwards of 5,000; the local preachers decreased by nearly 100, and the traveling preachers increased 150; 1909—increase in membership, 56,063; increase of local preachers, 138; increase of traveling preachers, 54; Sunday school increase in membership, 55,232; Epworth League increase 3,355. *The Methodist Review*, and the *Christian Advo-*

cate, both issued at Nashville, Tenn., are the leading publications of the denomination.

Methodist Protestant Church. An evangelical Christian denomination established in 1828 by members of the Methodist-Episcopal Church who refused to remain in the mother church on account of the General Conference of 1824 excluding laymen. The name Methodist Protestant Church was adopted two years after the separation. The church has experienced a healthful growth in the South and Central West and in 1909 had 2,300 churches, 1,362 ministers, and a membership of 188,806. Foreign and Home missions are supported by the church, publishes the *Methodist Protestant* and *Methodist Recorder* and carries on at Pittsburg, Pa., and Baltimore, Md., successful publishing establishments. In 1907 representatives of the church joined in a council of delegates from the United Brethren and Congregational Church and adopted an Act of Union, which came up at the National Council of Congregational Churches at Cleveland, Ohio, and was postponed. In 1908, at the General Conference of the Methodist-Episcopal Church, at Baltimore, Md., commissioners were appointed to visit the General Conference of the Methodist Protestant Church, in session at Pittsburg, Pa., with a view of uniting the two bodies. The matter was favorably considered and a commission appointed to meet commissioners of other offshoots of the Methodist-Episcopal Church with instructions to formulate a plan of union for presentation at the next General Conference. Up to 1910 all efforts to effect a union either with the Congregational Church or with the Methodist-Episcopal Church were postponed or deferred by the inaction of the larger bodies.

Metric System. There is an International Bureau of Weights and Measures for the furtherance of the metric system, which was organized as the result of a treaty signed in Paris in 1875 by 17 nations. Some of the nations that support it at the present day are United States, Great Britain, Germany, Russia, France, Austria, Belgium, Spain, Italy, Mexico, Peru, Portugal, Sweden, Norway, and Switzerland. The Bureau of Standards of our Department of Commerce and Labor published a table of metric and United States equivalents. It was primarily intended to furnish the necessary information to those interested. The Bureau receives from 20 to 50 inquiries daily. The American Society of Civil Engineers took up the subject in 1908 and a special committee was appointed to investigate the metric system. Its report urged that each State pass a law requiring the metric system of weights and measures be taught in all public and private schools of every grade beginning with the youngest pupil, the teaching to be a graphic method as the primary effort, the translation into English units by computation, as a secondary effort; and to secure uniformity and practical usefulness of the work, the subject should be taught as prescribed and regulated by the National Bureau of Standards at Washington. The report went on to urge Congress to declare after a certain date the International metric system of weights and measures as the only lawful standard throughout the United States, its territories and possessions and that failure to comply with the act be punishable by fine

METRIC SYSTEM—MEXICAN WAR VETERANS

or imprisonment. The use of the metric system has already been made legal by an act of Congress passed in 1866. Provision was made in it to supply every State of the Union with a set of metric weights and measures. In 1878, the medical department of the navy adopted the metric system. By an order approved by the secretary of the treasury on 5 April 1893, the office of weights and measures was to regard in the future the international prototype meter and kilogram as fundamental standards. The foreign postal rates were next based on metric weights. They are also used in coinage. In 1894, the international electrical units based on the metric system were made the legal units of electrical measures in the United States. The medical department of the war department adopted the metric system in 1894. In 1899, by proclamation of the military governor, the metric system was made obligatory in Porto Rico, viz. (1) The use of the metric system of weights and measures and its nomenclature are obligatory; (2) its use enforced in all transactions, sales, contracts, etc.; (3) wholesale and retail mercantile establishments shall sell their goods to the public conformably to the metric system. It was made legal in the Philippines in 1901. The system has made little substantial headway in England. Successive committees of each house of Parliament have reported in its favor, but that is all. Chambers of commerce and agriculture in all parts of England have carried on the agitation. The colonial conference of 1902 recommended the use of the metric system throughout the Empire. In 1895, a committee of the House of Commons presented a report urging that the metric system be made legal at once and compulsory in two years. A bill to this effect passed a second reading but got no further. In 1897, the metric system was made legal for trade, but not compulsory. In 1904, a committee of the House of Lords approved a bill to make it compulsory in five years. The bill passed the Lords but was not brought up in the Commons. In 1907, an almost identical measure was introduced in the Commons. It was opposed, however, by the then president of the board of trade, and its second reading was defeated on division. The essential features of the system are embodied in a report made to the French National Academy by the Academy of Sciences in 1791. France invited a number of other nations to cooperate in establishing the new system. Holland, Denmark, Switzerland, and Spain with several minor States were represented at the International Conference which met in Paris in 1799 to accept metric standards constructed under the direction of the French institute. The system was not in general use in France until 40 years later. The fundamental unit of the metric system is the meter, which is the unit of length. From this the units of capacity and weight are derived. Thus the gram is the unit of weight and the liter that of capacity. All other units are decimal subdivisions or multiples of these three which bear the following simple interrelation: for all practical purposes, 1 cubic decimeter equals 1 liter and 1 liter of water weighs 1 kilogram, or 1 cubic meter of water measures 1 kiloliter and weighs 1,000 kilograms or 1 ton (metric). The advantages of the metric system are the simplicity of the

relations existing between the units of length, area, volume and weight, the uniformity which would follow the adoption by England and the United States of all units measured throughout the world, 1 accepted standard, 1 mensuration table. The decimal relation between the metric units offers an inestimable advantage in all scientific work and the arts.

Metropolitan Museum of Art. See ART, METROPOLITAN MUSEUM OF.

Mexican War Veterans, National Association of. During the first week of Sept. 1910 taps sounded for the last time for the National Association of Mexican War Veterans. For their 1910 convention at Indianapolis only twenty-eight veterans, with bowed shoulders, whitened hair, and faltering steps, were able to get to the meeting. These, too, were all from near-by States from which the journey to the convention was not difficult. As they looked into one another's eyes the realization that they would not be able to so gather again dawned upon them. So the slender roll-call was read for the last time and the men who had fought with Winfield Scott, summoning up the last vestige of military immovability, gravely disbanded forever. The oldest man to answer the final roll-call was Frank A. Hardy, Company I, Third Ohio, of Piqua, Ohio, who had reached ninety-two years; while Jeremiah Hendron, Company D, Fifth Indiana, of Greenfield, Indiana, seventy-eight, was the youngest.

Impressive and pathetic as the final dissolution of the National Association of Mexican War Veterans was, it was more or less expected. According to the last pension report there were 2,459 survivors of the war with Mexico, and 6,633 widows. Many of these have died since the publication of the report, and the remainder have become so feeble that attendance at another convention would be an impossibility for them.

A reunion of the veterans was held in 1883 at Washington. More than a thousand turned out on that occasion and, parading smartly through the streets of the nation's capital, they made a splendid showing. The next gathering was in Feb. 1906, and the contrast was sad to behold. Less than a hundred men were present and one and all showed the effects of the journey. The 28 who managed to get to the 1910 convention understood the futility of making a like effort again.

The war with Mexico lasted from April 1846 until April 1848. The total strength of the United States Army during hostilities consisted of 54,243 infantry, 15,781 cavalry, 1,782 artillery, and 25,189 recruits—a total of 96,995 men. The number which actually saw action in Mexico exceeded 83,500, not all called out at the same time but in successive periods. At the close of the war, according to the adjutant-general's report, there were more than 40,000 men in the field.

The Association of Mexican War Veterans was founded in Washington by Col Alexander M. Kennedy, who in 1873 issued a call to all surviving soldiers, sailors, and marines who had served in that war to organize throughout the United States in a national body upon the broad principles of equality, fraternity, and charity, for purposes of good fellowship and

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proper assistance. The response to this appeal was prompt and hearty. One of the chief concerns of the association immediately became the procuring of pensions for needy veterans.

After the close of the Mexican War nearly all the survivors had enlisted on one side or the other in the Civil War. There was a tendency on the part of Congress to discriminate in the matter of pensions against those who had cast their lot with the Confederacy. It took fourteen years of persistent effort before the association could induce Congress to admit Mexican War veterans to pensions of \$8 a month.

There are still carried on the retired list of the United States Army the names of six officers who participated in the struggle with Mexico. They are: Brig-Gen Robert Murray, 88 years, of Elk Ridge, Md; Col George D. Dandy, 80 years, of Lawrence Park, Bronxville, N. Y.; Col Horatio G. Gibson, 83 years, of Washington, D. C.; Col. James Oatees, 84 years, of Washington, D. C.; Lieut-Col. Albert B. Kauffman, 82 years, of Webster Groves, Mo; and Maj William Fletcher, 79 years, of Washington, D. C.

Mexico. A republic occupying the southern part of North America, between the United States and the Central American isthmus. Its pre-Spanish history goes back into the ages beyond the beginning of history, and its population still includes families of the unmixed Aztec blood.

Area and Population.—The country is divided into the Atlantic, Inland and Pacific groups of States. The Atlantic States, including Tamaulipas, Vera Cruz, Tabasco, Campeche, and Yucatan, have an area of 124,692 square miles, with a population of 1,760,441, averaging 14.1 per square mile. It is greatest in Vera Cruz and Tabasco. The Inland States include Chihuahua, Coahuila, Nueva Leon, Durango, Zacatecas, San Luis Potosi, Aguascalientes, Guanajuato, Querétaro, Hidalgo, Mexico, Federal District, Morelos, Tlaxcala, and Puebla, the total area being 316,125 square miles, with a population of 1,919,697, averaging 22.7 per square mile. The Pacific States comprise Sonora, Sinaloa, Jalisco, Colima, Michoacan, Guerrero, Oaxaca, Chiapas, and the territories of Tepic and Lower California, with a total area of 324,768 square miles and population of 4,653,781, averaging 14.3 to the square mile. There are also islands aggregating 1,420 square miles in area. The total area of Mexico is 767,005 square miles and the total population exclusive of the islands, 13,605,919.

The population is 19 per cent of pure or nearly pure white race, 43 per cent of mixed race, and 38 per cent Indian. The foreign population is about 57,500, comprising Spanish, 16,258; United States, 15,265; Guatemalan, 5,804; French, 3,976; British, 2,845; Cuban, 2,721; German, 2,565; Italian, 2,564; Chinese, 2,834.

Mexico, the largest city and the capital, has a population of 344,721; other important cities are Guadalajara, 101,208; San Luis Potosi, 61,019; Leon, 63,263; Monterey, 62,266; Pachuca, 37,487; Zacatecas, 32,856; Guanajuato, 41,480; Mérida, 43,630; Querétaro, 33,152; Morelia, 37,278; Oaxaca, 35,049; Orizaba, 32,894; Aguascalientes, 35,042; Saltillo, 23,966; Durango,

31,092; Chihuahua, 30,405; Vera Cruz, 29,164; Toluca, 25,904, and Celaya, 25,565.

Government.—The constitution of Mexico bears the date 5 Feb 1857, with various modifications down to May 1908. Mexico is a federative republic, the States having a right to manage their own affairs. The legislative power is vested in a Congress consisting of a House of Representatives and a Senate and the executive in a President. The Senate consists of 56 members, and the House of Representatives has one member for every 40,000 inhabitants. The President holds office for six years, and may be elected for consecutive terms. The President since 1876 has been Gen D Porfirio Díaz, and the Vice-President is Senor Ramon Corral. There are eight Secretaries of State, heads of the departments of Foreign Affairs, the Interior, Justice, Public Instruction and Fine Arts, Fomento, Colonization and Industry, Communications and Public Works, Finances and Public Credit; War and Marine. In the remote mountain and forest regions of Mexico there is practically very little governmental authority.

Finance.—The receipts in 1909 were \$111,771,867, and the expenditure was \$93,177,441. The budget estimate for 1911 amounts to \$100,793,000, revenues, the largest item in which is the import duties, \$42,000,000, next to which are the receipts from stamps, excise, etc., \$30,305,000. The expenditures amount to \$100,306,268, the largest items being Finance, \$35,495,666, War and Marine, \$20,459,762, Public Works, \$13,604,495, and Home Department, \$12,646,632. The outstanding gold debt on 30 June 1908 amounted to \$153,681,300, including the City of Mexico loan; silver debt \$133,736,875; floating debt \$465,233. The fiscal value, which is taken as one-third less than the actual value, of property in Mexico, in 1905, was estimated at \$1,088,072,965.

Army.—See ARMIES OF THE WORLD.

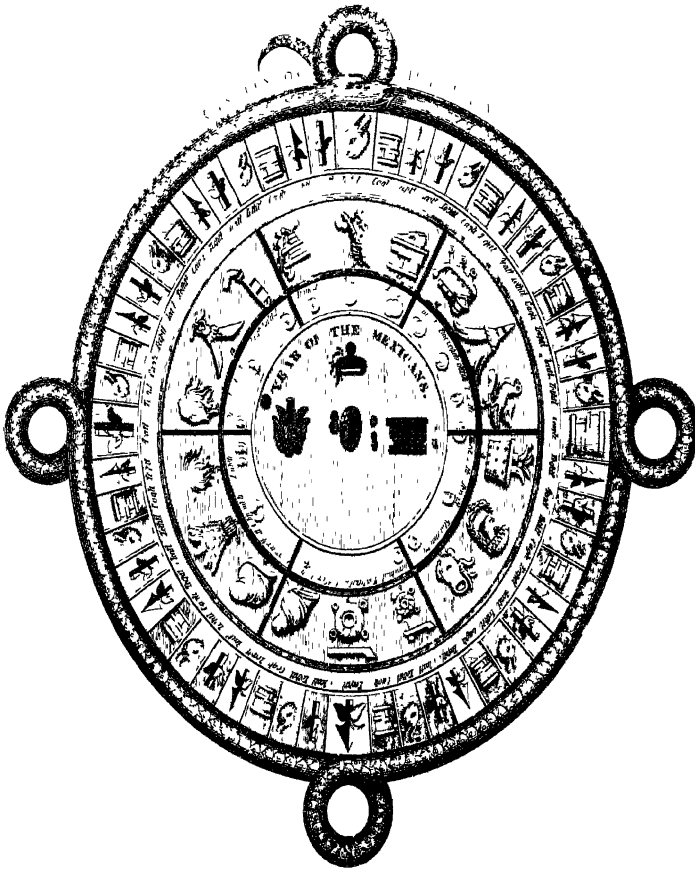
Navy.—See NAVIES OF THE WORLD.

Education and Religion.—Education is free and compulsory. In 1904 there were 6,488 elementary schools supported by the Federal and State governments, and 2,706 supported by municipalities, with 620,476 enrolled pupils. For secondary instruction there were 36 schools with 4,642 pupils. For professional instruction there were 33 colleges for men, 15 for women and 17 mixed, with 9,018 enrolled students. The private, clerical and association schools numbered 2,281 with 135,838 pupils, nearly equally divided between boys and girls. The National Library has over 180,000 volumes, and there are 138 other public libraries. The number of periodicals published was 459, nearly all in Spanish.

The prevailing religion is Roman Catholic, but the Church is independent of the State, and there is toleration of all religions. No ecclesiastical body can acquire landed property. There were, in 1900, 13,533,013 Roman Catholics and 51,795 Protestants.

Agriculture.—While this industry occupies a considerable part of the population it is carried on generally in the most primitive ways. The cultivated lands number 30,027,500 acres; pastoral lands 120,444,200 acres; forest lands, 43,933,200 acres. Among the products of the land are maize, cotton, henequen, wheat, coffee,

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One of the peculiar devices by which the ancient Mexicans computed time

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and beans. The diet of the mass of the people consists of corn meal in some form, beans, and coffee; red peppers are much used in cooking, and the utensils used in kitchens are, like the farm tools, primitive.

Cotton is grown in the Laguna districts on the Nazas River and is dependent on irrigation, which is being extended. There are five cotton mills in that region, with about 50,000 spindles. The output of sugar and molasses amounts to some \$13,000,000 a year, and the production of spirits to \$10,000,000 a year. There are many agricultural colonies established by the Government, by companies, or by persons authorized by the Government. There were in Mexico at last accounts 5,142,000 head of cattle, 859,000 horses, 334,000 mules, 288,000 asses, 3,424,000 sheep, 4,206,000 goats and 616,000 pigs, the value of the whole being rather more than \$120,500,000. Rubber is one of the industries somewhat important, but the wasteful methods of gathering the caoutchouc have often made rubber plantations less profitable than they might be. Mexican ranches have been more or less exploited in many cases, by foreign investors who desired quick returns for their capital, and comparatively little has been done toward the permanent enrichment and development of the country.

Exports and Imports.—The imports and exports in 1908-09 were as follows: Imports: Animal, \$6,415,000; vegetable, \$14,990,000; mineral, \$22,755,000; textile, \$8,105,000; chemical, \$4,930,000; alcoholic, \$2,840,000; paper, etc., \$2,270,000; machinery, etc., \$10,270,000; carriages, \$2,200,000; arms, etc.; \$1,290,000 various, \$3,710,000. Total, \$79,785,000. Exports: Gold, \$20,015,000; silver, \$38,685,000; copper and ore, \$10,400,000; other minerals, \$5,530,000; coffee, \$6,400,000; henequen, \$12,190,000; other vegetables, \$16,080,000; hides, \$4,600,000; animal products, \$2,500,000; manufactured, \$1,300,000; various, \$1,230,000. Total, \$119,030,000.

The imports and exports by countries in the same year were:

Country	Imports	Exports
United States	\$46,210,000	\$88,265,000
Great Britain	10,095,000	12,215,000
Germany	8,745,000	6,560,000
France	8,305,000	5,620,000
Spain	2,645,000	625,000
Belgium	970,000	2,960,000
Italy	920,000	12,500

Manufactures and Minerals.—In 1908 there were 145 cotton factories employing 35,816 workmen. The consumption of cotton was 36,040,276 kilos, the output of yarn 2,420,626 kilos, and of cotton piece goods and prints 16,280,843 pieces. There were 469 tobacco factories, the output of which was 515,324,969 packets of cigarettes, 42,662,997 cheroots, 54,182,881 cigars, 290 packets of snuff, and 77,385 kilos of tobacco. There were 1,459 distilleries giving an output of 44,781,859 litres of spirits of various sorts.

Mining is carried on in 24 of the States and Territories, and nearly all the mines yield silver, either alone or with other ores, some of them have been worked since Aztec times. The output of gold in 1907-08 was 30,395 kilos, value £3,809,665; silver, 2,151,014 kilos, valued at £8,544,689. The following were the mineral products exported in 1907:

Mineral	Kilogrammes
Gold	21,469
Silver	2,434,460
	Metric tons
Copper and ore	166,764
Lead and ore	76,187
Iron and ore	96
Antimony	4,615
Antimony ore	681
Zinc ore	93,246
Graphite	3,202
Marble	897
Salt	2,158
Asphalt	4,486

Communications.—On 16 Sept. 1908 there were 15,100 miles of railway, the main lines of which are merged in one corporation controlled by the government. Some 6,000 miles have a gauge of 4 feet, 8½ inches and the rest a gauge of 3 feet or less. In June 1909, the harbor works at Salina Cruz were completed. The most important port is Tampico. The mercantile marine in 1905 consisted of 32 steamers and 29 sailing vessels.

The telegraph lines comprised in 1908 39,865 miles, mostly belonging to the Federal Government, and there were 501 Federal officers. There were 850 miles of Federal telephone, and there are six wireless telegraph offices. In 1909 there were 2,974 post-offices, and 184,000,000 letters, post-cards and packets were carried.

Social Conditions.—There are no complete statistics regarding crime and pauperism. As to the latter, the climate and fertility of the country make it comparatively easy for even the poorest to live somehow. Near the border between the United States and Mexico there has been for generations a sort of No-Man's Land to which outlaws from the former country have fled, and at present the government of Mexico is in no position to police these thinly settled regions with any thoroughness. In 1895 more than 10,000,000 of the population could neither read nor write; not quite 2,000,000 could read and write, and the facts about approximately 39,000 more were not known. The social structure in many of the small towns and villages especially is very much as it was in the old Spanish days when Mexico held not only its present territory but most of California. However, there is a progressive party in Mexico as elsewhere, and it is facilitating progress, particularly in a commercial way.

History, 1910.—For a month in the fall of 1910 the centenary of Mexican independence was celebrated, the leading nations of the world taking part in the ceremonies, but hardly had this period come to an end when sedition broke out among the people and throughout Mexico for two months there were sporadic attempts at securing the presidency for Francisco I. Madero which his followers believed he had been cheated out of. If it had not been for the fact that the revolutionists were scattered and were unable to cover great distances with the railroads under the control of the government, Madero's party might have been able to meet with success, and if Diaz, who was 80 years old at this time, had died, Madero's chances would have been considerably increased.

Madero and his followers insisted that they were not attempting to overthrow Diaz, but were centering their attacks on the political body which had attached itself to him and

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was fattening under his protection. Madero is independently wealthy and a man highly thought of in Mexico, but he received less support than would have been the case, if Diaz had not remained to make it seem like an act of ingratitude against the man who had unquestionably made Mexico what it is to-day.

The centenary ended with September, and early in November revolution broke out. To the rest of the world this seemed sudden and unexpected, but the activities of the revolutionary junta had long been known, arms had been imported and ammunition secured. Madero made his attack from the borders of Texas and Arizona, much as Diaz had himself done in 1876, when as revolutionist, he took up arms against President Benito Juarez and his two successors, Lerdo de Tejada and Iglesias. The Juarez government was, however, thoroughly discredited, and Diaz was received with sympathy by all classes. In his time Diaz appeared as a strong figure, able to seize a serious situation and force the country, long wasted by warfare and crime, into the ways of peace. The Mexican people trusted to his ability and he realized their hopes. Mexico thrived as never before and, although it was necessary to give valuable concessions, the resources of the country were developed by foreign capital. Among the more ignorant there has always remained a feeling against the Americans in Mexico, but the people generally have not been slow to see the economic advantages accruing from having the mines developed, railroads built, etc.

Until 1904 Diaz was elected always without question or opposition and gave the country a better government than anyone else had ever been able to bring about. But at that time, being 74 years of age, he wished to transfer some of the burden of government on other shoulders and secured the election of Corral of Sonora, as vice-president, a position having been provided for him by a change in the constitution. The people were not in favor of Corral, but had become so accustomed to accepting the will of the President that no serious opposition was offered.

Corral's period of office ended in 1910, when the next election took place, and, Diaz having stated that he would retire at this time, it was anticipated that an entire change of government would be possible. Long before election, however, Diaz disillusioned the people and also made it plain that he wished Corral to be elected with him. This meant that Corral would probably succeed to the presidency during the following six years, and to this there was a strong objection. Many Mexicans were not in favor of what practically amounted to Diaz choosing his own successor in office. General Bernardo Reyes, Governor of Nuevo Leon, was proclaimed by a new party for the vice-presidency, but before the election period arrived, he resigned his post and was sent to Europe on a mission which was clearly designed to secure his absence.

At that time the party supporting Madero took form and Madero appeared on the stump in his own behalf. For this he was arrested by Diaz charged with arousing sedition among the people, and he was still in jail when the election took place. Under these circumstances, with the country still strongly in favor of Diaz,

in spite of his domineering ways, there was no question as to the election of the Diaz ticket, and Madero was only released from prison when the matter was entirely settled and it was thought he could cause no trouble. First he was released on bail and later exiled. Going to San Antonio, Texas, he found other Mexicans who were waiting for the first chance to cause a revolution, and they persuaded him to take the leading part, which he was ready to do. In taking up the sword against the government, Madero made it plain many times that he did not desire the overthrow of Diaz so much as the government which had grown up about him and taken advantage of his weakness and old age to exploit the country in their own behalf.

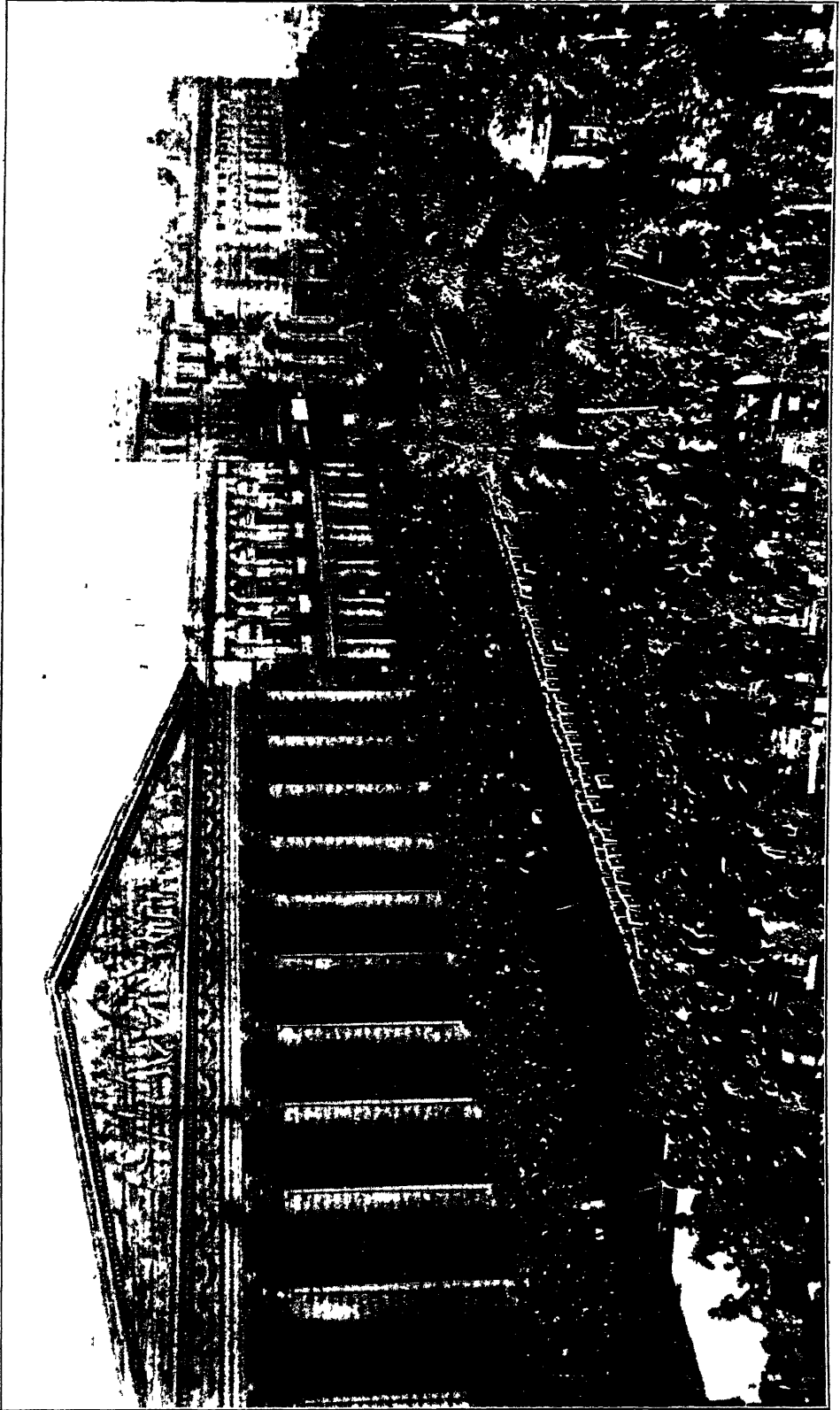
The incidents of the revolution were too complicated to be well understood outside Mexico, and were frequently accompanied by anti-American demonstrations which made it appear that the malcontents were anxious to deprive the Americans of their property rights, which had developed into many millions.

The first signs of disturbance were in Vera Cruz, where bandits attacked the American planters, and upon presentation by United States Ambassador Henry Lane Wilson, troops were sent to quell the disturbance. As early as the middle of October the rurales killed the bandit king, Santanon, scattering his following.

The outlaw, Alfredo Villa, and his band, who made their rendezvous in the mountains of Curango, enlarged their field of operation at about this same time and invaded the ranches of Parral. At this time both Villa and his henchman, Claro Reza, fell in love with the same girl, and Reza carried her off to Parral, where he was arrested and sentenced to prison for his crime. Receiving a threat of death from Villa, he was allowed to entice Villa to civilization. This was done at Chihuahua, but in the encounter Reza was killed and Villa again escaped. After a period of devastation, Villa appeared in Parral after night and was betrayed by a woman he had come to see.

The bold actions of the bandits were but an indication of the unrest, and on 9 November, a sudden outbreak against Americans took place in the City of Mexico, which was meant as an indirect attack on the administration for permitting Americans to obtain so strong a foothold in Mexico. As a demonstration against Americans it was not important, but showed the disposition of the people to pick on anything which gave them an opportunity to vent their dissatisfaction. They stamped on the American flag, stoned the offices of the *Mexican Herald*, and on the second night American business houses were attacked and a flag torn down from a candy store. Mexican papers published violent attacks on the Americans.

The immediate cause of the demonstration was the burning at the stake of Antonio Roderiguez at Rock Springs, Texas, Roderiguez having confessed to killing Mrs. Lem Henderson. The burning took place 3 November. Throughout Mexico Americans were in peril on this account for a number of weeks. An attempt was even made on the life of Ambassador Wilson and for a time the riots attained such proportions that several Mexicans were shot down by the police. Such bitter feeling



THE CROWD IN THE PLAZA MAYO, GATHERED ABOUT THE CATHEDRAL ON A FEAST DAY

was caused that a boycott against the United States was decided upon, but, the revolution making headway, attention was gradually diverted in that direction.

For a time Guadalajara was the storm centre and Carlos B. Carothers, who shot two men in the crowd attacking his house, was thrown into jail. The situation became serious there for a few days, but here, as elsewhere, the strong hand of Diaz stopped the rioting before it had fairly begun.

At the height of this trouble word reached Diaz that Madero was about to cross the Mexican frontier with a strong following, bent on taking advantage of the psychological moment in securing an overthrow of the government. At the same time incipient revolutions broke out in 12 of the southern States, and it soon became obvious that a general uprising was planned.

The revolutionists, naming themselves anti-re-electionists, made their first open avowal of revolution at Puebla, and a clash between them and Mexican troops took place 17 November. This, with the uprisings in the south, were premature, as the date fixed was Sunday, 20 November. At this time circulars began to appear throughout Mexico sent from San Antonio, containing the declaration, "I, Francisco I. Madero, will place myself at the head of a revolutionary party against the Government of Mexico. Between the 20th and 30th of November I shall lead my followers against the Government of Mexico."

The next day a serious rebellion came to a head in Puebla and 170 were killed. The fight centered about the house of Aquiles Cerdan, who had taken refuge in a tunnel. Otherwise the town was comparatively quiet. A large body of revolutionists were at Cerdan's house discussing plans when attacked, thus bringing on a serious revolution two days in advance.

On 19 November, Madero crossed the Mexican border and declared himself in open rebellion. The critical points were Laredo and Eagle Pass, and the Mexican Gen. Lauro Ville concentrated his forces at Nuevo Laredo. Simultaneously malcontents crossed the Mexican border from one end of the border to the other in small bands, ready to resist governmental forces. Within two days there was serious fighting at Durango, Torreon, Parral, and Gomez Palacio, the last-named town falling into the hands of the rebels, and 300 Federal troops joining the revolutionists. The Mexican Government immediately took possession of the telegraph and the railroads and prevented rapid spread of the revolution. Madero was slightly wounded, 24 November, in a fight between his forces and 200 rurales at Guerrero. At the same time Madero's real estate interests were confiscated, and ammunition and arms bound to revolutionists were seized at San Pedro, Monterey, Santa Barbara, and other points. The victory at Gomez Palacio was also turned into defeat by the arrival of 1,000 men with field pieces from Torreon, who retook the town and killed many revolutionists. Nevertheless it was appreciated that the government was face to face with a serious situation and there was fighting in seven States. The revolutionists had managed to secure field pieces and ample ammunition, and, in the mountainous country,

were able to hold their own and carry on at least a guerrilla warfare. The barracks and prison at Orizala were attacked and prisoners freed on the night of 21 November. This was one of the best planned and best executed movements of the revolutionists, but they were driven back by the Fifteenth Mexican Infantry after a hot fight. Troops were hurried from every direction, and it was realized that real revolution was in progress. Within a few days however, the Maderists met with serious reverses at Chihuahua and in the south, and it was apparent that the governor, having the facilities of communication in hand, was in a position to quell the outbreak, in spite of the extent of popular sympathy.

At the height of the rebellion, 1 December, President Diaz was inaugurated and took occasion to assure the world that peace would soon be restored. He took the position that it had been practically restored already. It had become known, meanwhile, that Madero was but slightly injured and entirely recovered and his followers were in a fortified position near Chihuahua. It was found that 90 per cent of the inhabitants of that section were at least not hostile to the rebels. This remained the stronghold of the Maderists. They were able to force an agreement from the owners of the Mexico Northwestern Railroad not to haul troops in to attack them, in return for protection. Nevertheless, after another battle had taken place, placing General Navarro in sore straits, a train load of soldiers was sent in. They were attacked in a narrow defile and 31 were killed and 42 wounded. The battle lasted five hours. Three days later, however, two train loads of Federal troops, containing 1,300 men, were brought into Chihuahua and the government forces strengthened sufficiently to counterbalance the Maderists. At the same time the government centered its attention on breaking through the line of revolutionists with the purpose of attacking the revolution at its centre and putting an end to it. In this they were unsuccessful and the conflict was still in progress in 1911.

Meyer, Balthasar Henry, member of the Board of United States Interstate Commerce Commissioners: b. Mequon, Wis., 28 May 1866. He was graduated at the State Normal School, Oshkosh, Wis., in 1893, and in law from the University of Wisconsin, B.L. in 1894, and Ph.D. 1897. He continued post-graduate courses in the University of Berlin, 1894-95. His pedagogical school work was as teacher of a district school, 1884-86; as principal of schools in Fredonia, Wis., 1887-89, and as head master of the high school, Port Washington, Wis., 1889-92. He then went to the University of Wisconsin, where he was an honorary fellow, 1895-96, a university fellow, 1896-97, an extension lecturer, 1895-97; instructor in sociology, 1897-99; assistant professor of sociology, 1899-1900; professor of political economy, 1900-10. He served as a member of the railroad commission of Wisconsin from July 1908, and as an expert special agent for the Bureau of Census and Interstate Commerce Commission to determine valuation of railways in the United States, 1904-05, and in Dec. 1910, he was appointed by President Taft a member of the Board of the United States Interstate Commerce Commissioners to fill the vacancy in the board caused

by the promotion of Martin A. Knapp to be judge of the new Court of Commerce, organized in Jan 1911. He was a collaborator of the Carnegie Institution, member of the American Economical Association, of the American Academy of Political Social Science; of the National Municipal League, of the Wisconsin Historical Society, and of the National Child Labor Commission. He wrote 'Railroad Legislation in the United States' (1908), and numerous papers on economics.

Meyer, George von Lengerke, American politician · b Boston, Mass, 24 June 1858. He was graduated at Harvard University A.B. 1879, and engaged in business in the office of Alpheus H Hardy & Co, of Boston, 1879-81, and in 1881 as a member of the firm of Linder & Meyer, Boston. He was a member of the city council, 1889-90; alderman, 1891, a Republican representative in the State Legislature, 1892-96, and speaker of the House, 1894, 1895, and 1896. He was a member of the Republican National Committee in 1900, and in Dec. 1900 was named by President McKinley for United States Ambassador, extraordinary and plenipotentiary, to Italy as successor to Gen. William F Draper, resigned, and in Jan. 1901, he went to Rome and established the American Embassy in Palazzo Brancaccio. In 1905 he was transferred to the embassy at Russia, as successor to Robert S McCormick, serving until 1907, when he was recalled and appointed Postmaster-General in the cabinet of President Roosevelt, 4 March 1907. On the election of President Taft, he was given the portfolio of Secretary of the Navy, 6 March 1909.

Michigan. A State of the North Central division of the United States, with an area of 58,915 square miles, of which 1,485 square miles is water. The capital is Lansing, but the largest city is Detroit, with 500,000 inhabitants. The population of Michigan in 1910 was 2,810,173, an increase of 389,191 or 16.1 per cent in the past 10 years. The population of the State per square mile is 48.9. Michigan ranks 8th in population.

Agriculture—The State is largely agricultural. In 1910 the number of farms reported was 206,376, as compared with 203,261 in 1900, an increase of 3,115 or 2 per cent. The total value of farm land and buildings was given, in 1910, as \$897,057,000, as against \$582,518,000 in 1900. The reported value of farm implements and machinery was \$49,771,000. The total acreage was 18,913,000 acres and the improved acreage was returned as amounting to 12,819,000 acres. The average acres per farm reported in 1910 was 92, as against 86 in 1900, a gain of 6 acres, or 7 per cent. The average value per acre of farm land and buildings in 1910 is stated as \$46, as against \$33 in 1900. The expenditure for labor in 1910 reached the sum of \$18,905,000, as compared with \$10,717,000, an increase of \$8,188,000 or 76 per cent. The expenditures for fertilizers amounted, in 1910, to \$936,000, while in 1900 it was \$492,000, a gain of \$444,000 or 90 per cent. Farms of 19 acres and under numbered 14,561; 20 to 49 acres, 49,711; 50 to 99 acres, 73,632; 100 to 174 acres, 50,576; 175 to 499 acres, 17,126; 500 to 999 acres, 605; 1,000 acres and over, 165. The wheat crop for 1909 was 14,570,000 bushels; corn, 69,950,000 bushels; oats, 43,310,000 bushels.

The corn acreage in Michigan for 1910 was 2,100,000 acres, yield per acre, 32.4 bushels; crop, 68,040,000 bushels; price per bushel, 53 cents, total farm value, \$36,061,000. The oats acreage for 1910 was 1,505,000 acres, yield per acre, 34 bushels, crop, 51,170,000 bushels, price per bushel, 35 cents, total farm value, \$17,910,000. The barley acreage was 67,000 acres, yield per acre, 26 bushels, crop, 1,742,000, price per bushel, 58 cents; total farm value, \$1,010,000. The rye average was 350,000 acres; yield per acre, 15.3 bushels; crop, 5,355,000 bushels; price per bushel, 68 cents, total farm value, \$3,641,000. In 1910 the number of sheep was 2,151,000, and the wool clip (1909) yielded 9,000,000 pounds of wool, valued at \$2,208,000. Other live stock in 1910 consisted of 746,000 horses, 936,000 milk cows, 963,000 other cattle, and 1,159,000 swine.

Mining and Manufactures—Michigan has immense resources of iron ore in the Marquette, Menominee, and Gogebic ranges. The total output of ore in 1908 amounted to 8,839,199 long tons (value, \$25,150,861). Copper mining in the Lake Superior region is of very great importance. The yield of copper amounted, in 1908, to 222,289,584 pounds (value, \$29,342,225); silver, in 1908, was produced to the amount of 294,100 fine ounces (value, \$157,300); salt, 10,194,279 barrels (\$2,458,303); coal, 1,835,019 short tons (\$3,322,904). The output of the clay-working industries (bricks, tiles, etc.), was valued at \$1,728,790; of Portland cement, 2,892,576 barrels (\$2,556,215). Graphite, asbestos, grindstone, gypsum, sandstone, limestone, mineral waters, and (in small quantity) petroleum are worked. The mineral output in 1909 including pig-iron, but not iron-ore, was about \$45,000,000. The manufacturing industries of the State are concerned chiefly with lumber, timber, and agricultural products, metal working, and machinery. The number of manufacturing establishments reported at the last census was 7,446, with an aggregate capital of \$337,894,102, 7,732 proprietors or firm members, 17,235 clerks, etc., and 175,229 wage-earners. The cost of the materials used during the year was \$232,516,583 and the value of the output was \$429,039,778. Some of the more important industries with their capital are as follows: Lumber and timber, \$38,507,207, planing mills, \$8,770,537, foundry and machine, \$24,290,075; flour and grist, \$7,654,270; copper smelting, \$2,378,315; carriages, wagons, \$13,610,960; railroad cars, \$10,245,958; furniture, \$15,797,769; leather, \$6,860,797; agricultural implements, \$14,432,106; tobacco, \$4,146,815. Other industrial products are butter and cheese, beet sugar, chemicals, various forms of iron and steel work, and malt liquors. Slaughtering and meat-packing have also considerable importance. In 1908 there were 8,723 miles of railroad in operation, besides 930 miles of electric railroad, exclusive of city lines.

Fisheries.—The number of persons employed in the fishing industry of State is 3,472; vessels, 110, value, including outfit, \$327,232; smaller boats, 1,647, value, \$266,770; value of apparatus of capture, \$820,000; value of property and cash capital, \$598,591; value of products, \$1,473,055.

Government.—The present Governor of Michigan is Chase S. Osborn, with a salary of \$5,000. The Lieutenant-Governor is John Q. Ross; Secretary of State, Frederick C. Martin-



CHASE S OSBORN,
GOVERNOR OF MICHIGAN.

dale; Treasurer, Alfred E. Sleeper; Auditor, Aramell B. Fuller; Attorney-General, Franz C. Kuhn, Superintendent of Education, Luther L. Wright; Commissioner of Insurance, M. O. Roland; Commissioner of State Land Office, Huntley Russell—all Republicans. The State Legislature consists of 132 members, of whom 116 are Republicans and 16 Democrats. The Senate has 32 members, and the House 100.

Finance.—The assessed valuation of Michigan is as follows: Realty property, \$1,315,627,642; personal property, \$371,528,073; total assessed valuation, \$1,687,155,697. The State has no bonded debt. For the ending 30 June 1910, the revenue and expenditure were as follows: Balance on hand, 1 July 1909, \$1,613,967; total receipts, \$13,412,149; total, \$15,026,116. Disbursements, \$12,538,233; balance on hand, 30 June 1910, \$2,487,883.

Religion and Education.—The more important religious bodies of the State are Roman Catholics, Methodist, Lutheran, Baptist, and Presbyterian. Education is compulsory for the school term for children from 7 to 16 years of age. In 1909 the public schools had 529,352 enrolled pupils and 17,407 teachers. The State has 4 public normal schools with 170 teachers and 6,281 pupils. The highest education provided by the State is given in the University of Michigan, founded in 1837 at Ann Arbor; in 1910 it had 420 professors and 5,671 students. Other institutions are: Adrian, 172 students; Albion College, 450 students; Alma College, 273 students; Detroit, 250 students; Hillsdale, 313 students; Hope College, Holland, 309 students; Olivet College, 255 students; Kalamazoo College, 229 students. There is a State Agricultural College at Lansing, founded in 1855; it has 90 professors and 1,191 students. There is a college of Mines at Houghton, with 37 instructors and 298 students.

Charities and Corrections.—Each county has three superintendents of the poor, appointed by the board of supervisors, and has (or may have) a poor-house. Either indoor or outdoor relief may be given; indigent persons suffering from disease or injury are sent to the University Hospital at Ann Arbor. When there is a distinction between county and township poor, the poor are supported by the township in which they have a settlement. Parents are liable for support of children and *vice versa*. In general, settlement is gained by a year's residence. To bring an indigent person into the State is a misdemeanor punishable by fine or imprisonment. Poor-houses are inspected and reported on by the State board of correction and charities. Number of persons maintained in the poor-houses during 1909 was 6,876. Average number for the entire year, 3,234. Within the State there are (apart from almshouses, etc.) 118 benevolent institutions, most of them provided by private persons or ecclesiastical bodies. They comprise 59 hospitals (six public) a sanatorium for the treatment of persons suffering from tuberculosis; six dispensaries, 23 orphanages (1 public) 26 homes for adults (one public), and three schools for the deaf and blind (3 public).

Legislation.—No regular legislative session was held in 1910. In 1909 the Legislature's work included a revision of the primary election law. The scope of the law was broadened so that all nominations be made on the first

Monday in September. A new State liquor law was enacted imposing more restrictions on the saloon business than the old law imposed. The general tax law was amended to make telegraph, telephone and express companies, as well as railroad and other corporations pay ad valorem taxes, instead of a specific tax on their gross earnings. A comprehensive system of reforestation was also outlined.

Microbe Photography. See BACTERIOLOGY.

Microbes. See BACTERIOLOGY.

Microscopical Society, American. The early work of this society was particularly in connection with the microscope itself, as an instrument. Since this instrument has practically reached its perfection there has not been the disposition to give attention to the study of it but rather to the fields of research opened up by it. The society has therefore been going through a transitory stage in the last 10 years, and now it is proposed to emphasize in its research articles: Fresh Water Biology, Medical Biology, Parasitology, and such related microbiological subjects. With 1911 the publication of the society becomes quarterly instead of annual.

Military Surgeon's Association. The Military Surgeons of the United States held the 19th annual convention at Richmond, Va., in Nov. 1910, and discussed questions relating to health in army and naval life. A feature of the meeting was the attendance of representatives of several foreign governments, including Great Britain, Canada, France, Germany, Mexico, China, and Guatemala. Governor Mann of Virginia and Mayor Richardson of Richmond extended the State's and City's welcome to the delegates. On the first day the army and National Guard were the subject of general discussion; on the second day the navy; and on the third, when the closing session was held, the United States public health and marine hospital service.

Militia. See NATIONAL GUARD.

Milk, Crusade for Pure. A wide-spread, national effort due to a more general understanding of the dangers of disease contagion from the products of the dairy. To the Department of Agriculture is due the credit of making a thorough study of the subject and giving it general publicity while state and city health boards and commissions have put to practical use the information so gathered.

Absolutely pure milk is hardly known in this country at the present time. There are individual cases of dairies, mostly under the supervision of local medical milk commissioners, which produce a milk "certified" to be free from tuberculosis and containing less than 30,000 colonies of bacteria to the cubic centimeter, but the largest percentage of both city and country milk is infected with disease germs. Four diseases are commonly transmitted through milk; typhoid fever, scarlet fever, diphtheria, and tuberculosis. The three first named diseases appear in the milk supply more or less sporadically and do not constitute a constant danger, but tuberculosis has been proved to be prevalent in 15 to 20 per cent of the 22,000,000 dairy cattle in this country. And, since the milk of several cows is usually mixed before delivery, the presence of one infected cow in a herd

usually results in the infection of the entire supply derived from that source.

Tuberculosis in cattle is now recognized as the most important issue in the pure milk crusade. Its existence is not confined to any portion of the country, although it is much worse in congested districts near large cities, 40 per cent of the cattle in many portions of the Eastern States having been shown to be suffering from it. It is also difficult to eradicate, cases having frequently been found after a few months in carefully kept herds producing the "certified milk" guaranteed by medical milk commissions. Experiments are now being made in an attempt to determine how many years of careful treatment will be necessary to free dairying districts of the disease. Government experts place the time at from five to ten years, but experience among the "certified" herds has shown the disease to be so stubborn that it may never be eradicated. It yields to regulation, however, to a marked extent. In States which have been particularly active, the percentage of affected cows has been reduced to as low as five and three per cent.

The pure milk problem presents so many difficulties and to many leading authorities has so many apparently hopeless aspects that there is a strong movement, especially among city health boards, to require the universal pasteurization of milk not from "certified" herds. Pasteurization has been in use to a considerable extent for a number of years, one-fourth of the supply of New York City having been treated to some form of the process. The pasteurizing has been conducted as a business undertaking by the milk dealers and dairymen by what is known as the "flash" or "instantaneous" method. The milk on arrival at the depots, is passed in thin sheets rapidly over surfaces heated to a point varying between 155 and 170 degrees Fahrenheit and, in practice, the milk is only held at the high temperature for a second or two. Thirty seconds is the longest period of maximum heat but this is rarely maintained.

The effect of instantaneous pasteurization is the killing of the lactic acid germs, which sour the milk, and, if the heat is maintained for the full thirty seconds, all the typhoid fever, scarlet fever, and diphtheria germs are also rendered harmless, but the tubercle bacilli are not killed by less than a heat of 185 degrees Fahrenheit for a full minute, or a much lower heat for a more protracted period.

Realizing that the instantaneous method of pasteurization does not prevent the danger of infection from tuberculosis, health boards are beginning to insist on the use of "holding machines," better described as large tanks used in connection with the instantaneous pasteurizers with the purpose of holding the milk at the required temperature for the period designated by law. "Holding machines" are now being manufactured by a number of dairy machinery companies, and, since there is no patent to limit the production, they will probably be in general use in a few years.

Since 1908 Chicago has been leading the fight for pure milk so far as the problem affects large cities. Acting under the advice of the Chicago Board of Health, a law was passed in that year compelling all milk dealers and dairymen to produce and distribute pure milk

by 1 Jan 1914, the intervening period of five years being allowed for the work of establishing more sanitary methods and the eradication of disease. And, in order to protect the consumer during that period universal pasteurization under the "holding method" is required unless the herds from which the milk is obtained have been proved to be free from tuberculosis.

The existence of tuberculosis is not determined merely by the ordinary methods used in determining the existence of human tuberculosis, since cows do not show the presence of the disease until they have been suffering with it for many months. By the use of tuberculin, however, the presence of the disease can be determined in 97 per cent of the cases. The tuberculin is injected and if the animal re-acts, she is removed from the herd and slaughtered. Frequently herds of cows are driven to the slaughter house to be killed which have no outward sign of the disease and it is only after they have been cut open that the adhesions are made apparent.

Such a large proportion of the dairy herds are now known to be suffering from tuberculosis, that effort is being made either to cure them or remove the afflicted animals to remote districts and permit the use of milk only after scientific pasteurization.

On 8 Dec 1909, the Department of Health of New York City secured the passage of an ordinance requiring more prolonged pasteurization, when pasteurization is used. The periods and lengths of time required according to the sliding scale, scheduled to go into effect 1 March 1910, follows: 158 degrees F. for 3 minutes; 155 degrees F. for 5 minutes; 152 degrees F. for 10 minutes; 148 degrees F. for 15 minutes; 145 degrees F. for 18 minutes; 140 degrees F. for 20 minutes.

The final adoption of a scale conforming in general outline to this one will eventually do away with certain frauds and misrepresentations at present practiced under the instantaneous methods of pasteurization and a great deal of the effort being expended in the pure milk crusade is to secure the adoption of similar scales.

The work of the Department of Agriculture, while largely educative, has been of inestimable value to local authorities which have not been in a position to arrive at scientific conclusions. Under advice from the Bureau of Animal Industry over a hundred smaller cities and towns now require the use of the tuberculin test on dairy cattle and the segregation and slaughter of all reacting animals. Score cards of inspection are also recommended by the Government and, through their general use, conditions in dairies are showing a steady improvement.

Figures have also been adduced showing the pronounced reduction of bacteria count by the simple, sanitary precaution of washing the udders of the cow before milking, and the use of narrowtopped milking pails, properly sterilized, instead of widetopped pails, washed in well water, has been demonstrated to mean the reduction in the bacterial count from hundreds of thousands per cubic centimeter to less than 10,000, which is considered practically pure milk.

Milk, Soured. Public interest during the past few years has been largely aroused by the discoveries of Professor Metchnikoff, and his

theories of "soured milk" and lactic acid. His views were expressed, for the average English reader, in his two books, 'The Nature of Man,' and 'The Prolongation of Life.' In these well-known works, he advanced the view that the decrepitude of old age, and, in a great degree, the cause of natural death, is due to the formation and activity of certain micro-organisms (*Bacillus coli*, *Bacillus purificus*, etc.) which developed in the large intestine, and poisoned the body by auto-intoxication. As a result of his experiments, he discovered that the bacteria found in lactic acid were destructive to these organisms, and he accordingly set himself the problem: How cultivate these particular bacteria in the human intestine? For once there, they would, by their action, destroy the offending bacilli, and thus lengthen and make healthier human life.

Now it is well known that lactic acid is one of the products of sour milk; and Metchnikoff first of all turned to it for help. He found, however, that these organisms could not be employed to advantage, for the reason that the lactic acid ferments found in sour milk grow best from 75° to 85°F., while the temperature of the human body is nearly 99°F. Obviously they were unsuitable.

It was at this juncture that the solution of the difficulty was found. Metchnikoff says

"I had no illusion as to the difficulty sure to be encountered in any effort to introduce lactic acid microbes into the intestinal flora which had been preoccupied by a number of other microbes. To make surer of the result, I chose the lactic microbe which is the strongest as an acid producer. It is found in the *Yoghurt*, which originates in Bulgaria. The same bacillus has often been isolated from the *lebey* of Egypt; and it is now proved that it is found in the curdled milk of the whole Balkan Peninsula, and even in the Don region of Russia" (*Century Magazine*, Nov. 1909).

Recourse was thus had to various natural sour milks—those containing the required bacilli. This was the only means that could be adopted, since a mere introduction into the body of lactic acid resulted in the splitting-up and absorption of the acid before it reached the large intestine. In ordinary sour milk, the lactic acid ferments are always associated with ordinary lactic acid bacteria, as well as others. When milk soured by the ordinary process is introduced into the intestines, it tends to create an acid surrounding, or environment, which favors the growth of the lactic-acid ferment.

When preparing the artificial milk for the market, the milk is first well boiled, to free it from injurious bacteria. The lactic ferments are then added. The milk is then kept at a uniform temperature of about 100°F., for from ten to twenty-four hours.

It has been asserted that this artificial preparation is of little practical value; but Herschel (*Proceedings Roy. Soc. Med.*, Jan. 1910) contends that, while its value had doubtless been overestimated in some cases, it will yet be found useful in cases of (1) auto-intoxication; and (2) in those cases in which the proteins putrefy abnormally,—including certain cases of acute enteritis and colitis. (Also in a number of minor ailments.) The home preparation of sour milk is not recommended, as presenting too many opportunities for contamination by

imperfect knowledge of bacteriology, and imperfect sterilization.

Milk Trust. See TRUSTS.

Millersville Normal School. Located in the heart of the rich country of Lancaster, Pa., is one of the oldest normal schools in the United States and the oldest normal school in Pennsylvania. It was organized in 1855 by the trustees of the Millersville Academy, a private corporation, the stock of which was owned by citizens of the neighborhood, who offered gratuitously to the county superintendent of schools the building and boarding accommodations for a teachers' institute. The institute opened 17 April 1855, and was held twelve weeks, and assumed the name of normal school before its close. The result of the institute was so satisfactory that the stockholders trebled the size of their buildings and established a regular normal school, the trustees elected by the stockholders appointing the faculty, and administering the affairs of the school, with a large amount of responsibility in the hands of the principal. It was recognized by the State as the first State Normal School on 2 Dec. 1855, the normal school law under which it was recognized, being adopted by the legislature in 1857 as the result of the experiment made at Millersville. This law, which created a system of State normal schools, did not provide for State ownership of these schools, but rather State control under the State superintendent of public schools.

The Millersville school receives annual appropriations from the State legislature in payment for the tuition of all students over 17 years of age who are preparing to teach in the public schools of the commonwealth. The aim of this institution is to prepare teachers both theoretically and practically for the business of teaching in all grades of public schools, especial attention being given to actual teaching and to the management of schools. It differs from most other normal schools in the fact that it teaches the academic branches thoroughly and at the same time pays especial attention to the pedagogy of teaching. Its courses in "methods," presented by the leading professors, are features of great value to the prospective teacher. Dr. E. O. Lyte has been principal of the school since 1887. He had been teaching there since 1868. The "plant" of the school is large, consisting of over a dozen buildings devoted to school purposes. The grounds are beautifully laid out, with forest trees, athletic field, a fine lake, etc. The value of the school property, October 1910, is \$670,000. In 1878, the stock of the school was changed by the stockholders so that no dividends can ever be declared by the management. No dividends were ever paid, the profits, when there were any, always being used by the school for betterments and improvements.

Mills, Darius Ogden, American banker and financier: b. 25 Sept. 1825; d. Milbrae, Cal., 3 Jan. 1910. After receiving a common school education, he was cashier of a bank in Buffalo for two years, then joined the "Forty-niners"; arrived in California he became merchant at Sacramento and soon founded the bank of D. O. Mills & Co., later becoming president of the Bank of California at San Francisco. In 1880 he came to New York and connected himself with many of the largest financial enterprises

of the East. He was a man of great public spirit and was interested in many movements for the betterment of social and educational conditions. His best known philanthropy was the building of several hotels where meals and lodging are furnished respectable men at nominal prices.

Milwaukee, Wis. According to the 1910 census, the twelfth city in size with a population of 373,857. The city covers an area of 22¾ square miles, and has 537 miles of streets, of which 81 are paved. The assessed value of the real property is \$177,499,925, and the personal, \$54,727,865. The tax rate is 25.65. The public debt of Milwaukee is \$9,273,750 and the annual cost of the city government \$6,250,000. Of this sum, the city spends \$1,488,963 on schools, whose pupils in 1910 numbered 48,902, and teachers and principals 1,247. The city owns its water works. There are 442 miles of mains. The daily capacity of the water works is 98,000,000 gallons. There are 419 miles of sewers. Much attention has been focused upon Milwaukee because it is the first large American city to elect a Socialist, Emil Seidel (qv) mayor. During 1911, more than 40 measures prepared by the new city government will be introduced in the Wisconsin legislature. They all tend to carry out the program of the Socialists, which, at present, is restricted by the existing laws. An important measure deals with the question of home rule. Under it, the city would be supreme over its affairs, except in such matters where the entire State might be affected. Permission is asked to erect and maintain four municipal hospitals, one of which is to be a maternity. Another very radical measure for which Victor Berger (qv), the leader of the Socialists is responsible, gives the city permission to start and maintain any new enterprise upon the referendum approval of a majority of the legal voters. Another measure would enable the city to take over and operate all the public utilities now in private hands and raise the bond limit of the city in order to meet the purchase price. Permission is also being asked by the city to acquire land for building modern homes for the workmen. There are also measures for a municipal cemetery, free dispensaries, and municipal slaughter houses and cold storage plants. These measures will have to be passed by the legislature in order to become effective.

Minerals in the United States. See **METALS.**

Miner, Maud, social worker: b. 1871. She graduated from Smith College, Northampton, Mass., A B 1906, A.M. 1909, and was offered a professorship in mathematics by her alma mater, but declined the honor. She became greatly interested in the betterment of the social condition of the women of the underworld, and her enthusiasm on this subject caused her appointment, by Magistrate Charles S. Whitman, as probation officer at the night court of New York City soon after its establishment on 1 Aug 1907. In this capacity she was enabled to study the conditions of wayward girls brought into the court, where she was constantly on duty from 6:30 p.m. to 3 a.m., and she was instrumental in having many girls released under her care and hundreds of first offenders have been turned back in the right path by her efforts. She was instrumental in establishing "Waverly House,"

in New York City, as a home for unfortunate girls, and she was chosen secretary of the Probation Association of New York, of which District-Attorney Charles S. Whitman is president, and in which Mrs. Russell Sage, Miss Annie Morgan, Andrew Carnegie, and other well-known philanthropists are interested. Miss Miner also established at Hillcrest, near Sandy Hook, N J, a summer home for girls. She says of her rescue work, "Preventative work is the best of all. We hear of girls who are exposed but not immoral and send workers to call on them and get them interested in something worth while", and "You can't lay down any rules, each individual requires different treatment." This is the secret of Miss Miner's success and of the deep regard in which she is held by the girls she has uplifted.

Mines, United States Bureau of. On 1 July 1910 the United States Department of the Interior instituted the Bureau of Mines, for the purpose of overseeing and regulating the vast mining interests of the country and cutting down the unnecessary death rate among American mine workers. The establishment of this bureau was a direct reflection of the growing regard for human life which is being felt throughout the world in this twentieth century. Formerly many thousand lives were lost in the mines each year (See **MINING DISASTERS**). Since coal mining began in the United States in 1820 the loss of life in that branch alone has exceeded the number of deaths sustained by this nation in all its wars, while more than a hundred thousand coal miners perished during the interval from 1890 to the date of the enactment of the law which created the Bureau of Mines. Already the federal government supervision of mining methods has showed that this most dangerous of occupations will be made as safe as most others. More than that, it will have an important economic significance for through it the former great waste of coal, gas, and other minerals will be largely reduced. This will mean not only an increase of the national wealth, but will also be of direct advantage to individual householders, since by the checking of the waste of millions of tons of coal each year their several fuel bills will be reduced in proportion. Precisely what the Department of Agriculture has done in the systematizing of the handling of agricultural products, the Bureau of Mines has set itself to do to mining. It will employ trained specialists to investigate all mining activities, keeping tabs with equal care on the small individual mine owners and the vast corporate interests; it will help protect adjacent property from poisonous mine fumes; will learn the nearest points where the government can get bricks, stone, tile, lime, cement, and other mining materials; and will scientifically ascertain what building materials are actually fireproof.

Most of the fatalities among miners are traceable to ignorance. They for the most part entirely lack knowledge of the explosive powers of coal-dust and fire-damp, nor have they any conception of what constitutes a really safe "safety lamp," often purchasing a dangerous one in order to save a few cents and thereby making themselves the innocent victims. By working directly with the miners, as well as with their employers, the Bureau of Mines will change these conditions. Prior to the creation of this

MINES

bureau the station at Pittsburg, Pa., in the very heart of the coal-mining district, had been under the control of the Geological Survey, and there life-saving experiments in the interests of miners of far reaching importance were inaugurated. This station, instead of being discontinued under the new régime will be made the headquarters of a series of schools to instruct the miners along practical lines. These schools will be established at Raton, N. M., for the inhabitants of Colorado, New Mexico, southern Utah, Wyoming, and Nevada; at Salt Lake City, for the central Utah field; and at points which will be accessible to Montana and Washington, to Oklahoma, Arkansas, southwestern Missouri, and southeastern Kansas.

These stations will undertake the work of instructing the miners, and showing them, by means of sham mine explosions how dangerous are coal-dust and fire-damp. The apparatus, called an explosive gallery, is at present at Pittsburg. It consists of a huge horizontal boiler plate, 100 feet long and 6 feet in diameter. Across the open end of this tube is placed a drumhead of heavy paper, the inside then being filled with fire-damp or coal-dust which electric fans mix thoroughly with air until they are of the same consistency as is ordinarily encountered in mines. The drumhead keeps the gas or dusty air from escaping, while at the other end of the tube is a 12-foot cube of reinforced concrete, holding a mortar aimed right down the tube and loaded with one of the explosives commonly used in mines. A wire connects this mortar with a key from which it may be fired at a distance; and parallel with the big cylinder, but 60 feet away, is the observation house. A long peep-hole extends along the rear wall of this building, and here the miners who are being instructed line up, with their faces to it. Plate glass half an inch thick protects their eyes, and a shield outside the building is so directed that the vision of the men is directly on a line with the long cylinder stretched along the ground. The pressing of a button then fires the mortar so that the coal-dust or fire-damp in the gallery explodes with a loud report. There are 16 port holes along the side of the cylinder, and the miners are made to note by these how the blaze of the explosion progresses along the tube from the mortar to that covered by the paper drumhead. The explosion, of course, blows the paper out and at the same time 16 iron doors to a row of openings along the top of the cylinder fly up on their hinges. These doors and the drumhead save the plant from being entirely wrecked by the explosion. As it is, smoke pours out of the tube while there is a loud detonation. This practical test, worked out with such a wealth of detail, will give most miners their first real demonstration of the fact that coal-dust and fire-damp are highly explosive. Here they will likewise learn the comparative safety of various explosives purposely used as blasts. Charges of dynamite, black powder, and different safety explosives will be fired from the mortar in the presence of coal-dust and fire-damp, so that the watching miners may learn the strength of the charge of each which may be used without danger of an explosion. A secondary purpose of the bureau in this work is to standardize mine explosives and recommend as permissible only those which act with safety in the "explosive

gallery." A second gallery, 30 feet long and 10 feet in diameter, will also be used to demonstrate how a mine may be blown up by sparks from defective wiring in the mines. The gas and dust pumped into this tube will be fired by a simple electric spark—instead of a mortar, as in the explosive gallery—which will flash between two ends of wire.

Another important phase of the work which the Bureau of Mines will undertake is the instruction of miners in the best methods of rescuing comrades in time of fire or explosion. The agitation which the bureau has started in this regard has resulted in legislation looking to the proper safeguarding of miners in several States, while others have made large appropriations for the furtherance of this, Illinois heading the list with a fund of \$80,000. Already the bureau has established federal rescue stations at Huntington, W. Va., Birmingham, Ala., Wilkes-barre, Pa., and Billings, Mont., while several more are under way. These stations maintain an emergency force, always ready to move at an instant's notice, carrying such equipment as will permit the most efficient efforts in rescuing imprisoned and entombed miners. Meanwhile the work of instructing the miners themselves in these important matters will be constantly proceeding. For the purpose a large glass-encased, air-tight room, containing difficult passages such as exist in coal mines is employed. There are always various obstructions of the sort prevalent in mines after they have been wrecked by explosions, while numerous dummies, weighing from 150 to 200 pounds, are strewn about to represent asphyxiated miners. This room is filled with sulphurous gas, and the rescue corps, clad in oxygen helmets, sent in. They remain two hours at a stretch, picking up dummies, giving them emergency treatment, placing them on stretchers, and carrying them away. The number of lives which the establishment of this department alone will be the means of saving is almost incalculable.

With regard to the safety lamp the bureau will adopt stringent means. The miner will be caused to place his lamp in a room along one wall of which a long, square tube will run with trap-doors of little compartments opening out of it. In these compartments the lighted lamps will be placed. When the doors are shut a current of gas will be blown through the tube. If any lamp then explodes, its use will not be allowed in the mines.

Another function of the new bureau will be the development of a uniform code of signals for use in mines. Formerly many lives have been sacrificed through needless mistakes in danger and hoisting signals. Standard fuses for explosives will also be inaugurated, since the fuses at present on the market have all possible degrees of speed, so that the miner can never be certain just how much time a new one will allow him. The bureau will investigate the effect of fire upon building materials of the mining category. These tests will be beneficial, not only to builders in general, but particularly to the government, which now expends nearly \$15,000,000 annually in its building operations. Hereafter, since the Bureau of Mines will examine all the stone, sand, gravel, clay, and other minerals used in national edifices, it is estimated that several million dollars will be saved to the government each year.

MINING IN THE UNITED STATES—MINNESOTA

The bureau will also pay particular attention to saving the nation's supply of iron ore, which will be exhausted before the middle of the next century unless science brings some relief. It will further strive to prevent the waste in milling, which now occurs, of more than one-third of the country's zinc, and the further waste of tons of copper which are daily carried away in the tailings of reduction plants.

Mining in the United States. See METALS

Minneapolis, Minn. According to the 1910 census, the population is 301,408 and the city is 18th in point of size. The area is $53\frac{1}{4}$ square miles. There are 537 miles of streets, of which 81 are paved. The net public debt is \$10,485,379 and the annual cost of the city government, \$4,525,000. Of this sum, \$1,492,800 is spent in public schools, whose pupils number 45,144, and teachers and principals, 155, \$555,000 on the fire department, and \$349,860 on the police. Minneapolis owns its own water works which cost \$6,360,000. There are 392 miles of mains, and the average daily consumption of water is 19,063,161 gallons. There are 251 miles of sewers. The great lumber companies operating mills near the forests maintain their storage and distributing yards in Minneapolis. The manufacture of furniture, sash-doors, and interior finishings amounts to \$12,000,000 annually. Minneapolis claims to be the leading city in the world in the manufacture of linseed oil. It is also the third largest fruit market in the country. The purchase by Armour and Company of land on the outskirts for a packing plant will make the city a leading stock market. Minneapolis is a great wholesale center, distributing goods annually of the value of \$300,000,000. Its natural trade territory embraces the states of Minnesota, the Dakotas, and Montana. The city has 4 nationals, 12 State, 4 savings banks, and 2 trust companies. The commercial banks have in capital and surplus, \$12,500,000, deposits of \$81,000,000, and annual clearings in excess of \$1,000,000,000.

Minnesota. A State of the West North Central Division of the United States with an area of 83,365 square miles, of which 4,160 is water. Its population in 1910 was 2,075,708, an increase of 18.5 per cent over 1900. The population per square mile is 25.7. Minnesota ranks 19 among the States. St. Paul is the capital. Its population is 163,065.

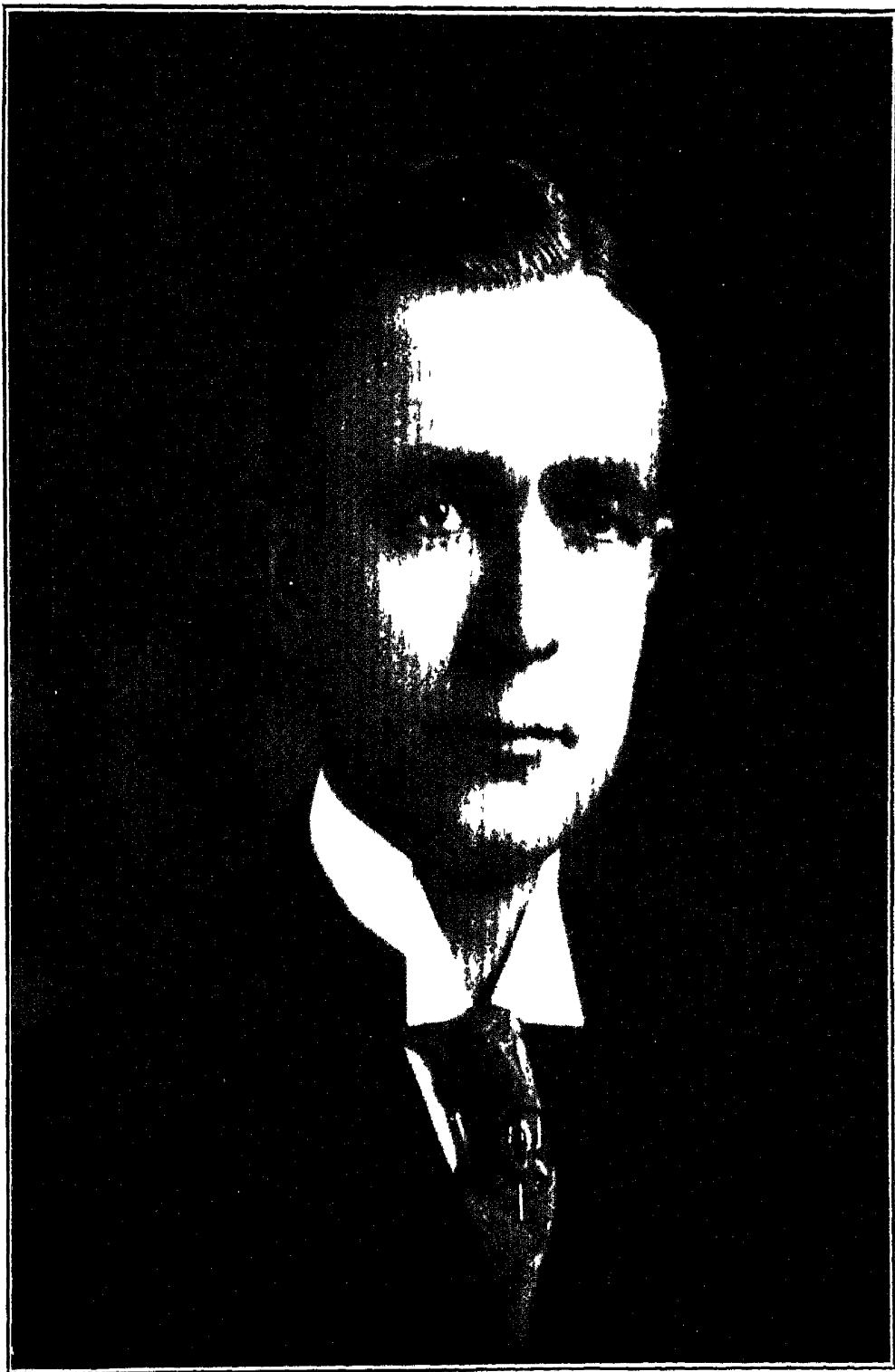
Agriculture.—According to the 1910 census, there were 155,479 white and 280 colored farmers in the State. The total acreage, 27,623,000, improved, 19,609,000, and the average acres per farm 177. Value of land and buildings, \$1,259,510,000. There has been an increase of 120 per cent in the total value of farm buildings alone, and 88 per cent in that of farm land and buildings. The value of the land is \$1,016,889,000, of the implements and machinery, \$52,243,000, and the average value per acre of land and building is \$46.00. During 1910, the expenditures for labor amounted to \$22,186,000, and for fertilizer, \$63,000. According to the figures given out by the Secretary of Agriculture on the acreage, production and value of important farm crops in the United States for 1910, Minnesota had the following yield during that period: Corn, 56,375,000 bushels on an acreage of 1,724,000, valued at \$25,369,000;

spring wheat, 94,080,000 bushels, acreage, 5,880,000, value, \$88,435,000; oats, 78,523,000 bushels, acreage, 2,736,000, value, \$25,127,000; barley, 26,985,000 bushels, acreage, 1,285,000, value \$16,191,000, rye, 1,955,000 bushels, acreage, 115,000, value, \$1,251,000; buckwheat, 64,000 bushels, acreage, 4,000, value, \$46,000; flaxseed, 3,540,000 bushels, acreage, 472,000, value, \$8,142,000; potatoes, 10,065,000 bushels, acreage, 165,000, value, \$6,442,000; hay, 908,000 tons on the same acreage, value, \$8,263,000. For 1910, the spring wheat production of Minnesota was more than one-third of the total of the entire country and more than twice that of South Dakota which ranks second. The farm animals of Minnesota, on 1 Jan 1910, were as follows: Horses, 767,000, value, \$85,137,000; mules, 9,000, value, \$1,026,000; milch cows, 1,125,000, value, \$37,125,000, other cattle, 1,288,000, value, \$17,560,000, sheep, 482,000, value, \$1,928,000; swine, 1,003,000, value, \$11,534,000.

Mining and Manufactures.—Iron ore is the chief mineral product of the State. The last figures available show that the annual production is about 18,652,220 long tons of the value of \$42,313,794. The chief sources of supply are the Mesabi range and the Vermilion. The production of the former was 17,725,014, and the latter 927,206. The 1908 figures showed a falling off of more than 10,000,000 tons and \$34,000,000 over those of 1907, but this has not continued, the financial depression of 1908 having had much to do with the decrease. There are about \$1,500,000 worth of clay products produced annually. Sand and mineral water are also produced in Minnesota. The last figures of the census on the manufactures show the capital employed in Minnesota to be \$184,903,271, the number of wage earners, 69,636, and the total wages paid, \$35,843,145. The value of the manufactured product has been estimated at \$307,858,073.

Fisheries.—According to the last data of the fisheries bureau, the value of fishery products are about \$200,000 per annum. In the last year there were 934 persons employed, utilizing 4 vessels and 689 boats. German carp is the most important fish. During the year, the catch weighed 1,132,400 pounds, of the value of \$26,320. The buffalo is next. The catch was 664,300 pounds, valued at \$22,460; the fresh herring, with 1,612,400 pounds, value, \$20,880, was third, and the salted herring, 1,165,200 pounds, value, \$17,610, fourth. Pike, pickerel, sturgeon, lake trout, and white fish are also to be found.

Government.—The Governor is Adolph O. Eberhart, Republican, whose term expires 1 Jan. 1913. Other important State officers are: S. Y. Gordon, Lieutenant-Governor; Julius A. Schmah, Secretary of State; Walter J. Smith, Treasurer; S. G. Iverson, Auditor, George T. Simpson, Attorney-General. One United States Senator is Knute Nelson, Republican, whose term expires 1913. The other Senator has not been chosen at this writing. Representatives in the Sixty-second Congress are Sidney Anderson, Republican; W. S. Hammond, Democrat; Charles R. Davis, Republican; Frederick C. Stevens, Republican; Frank M. Nye, Republican; Charles A. Lindbergh, Republican; Andrew J. Volstead, Republican; Clarence B. Miller, Republican; Halvor Steenorson, Repub-



ADOLPH O EBERHART,
GOVERNOR OF MINNESOTA

MINNESOTA—MINUTE MEN MEMORIAL

lican. The legislature consists of: Senate, 42 Republicans, 19 Democrats, 2 Independents; House, 89 Republicans, 26 Democrats, 5 Independent

Finance.—The receipts for the fiscal year ending 31 July 1910, were \$14,810,944.43, and the cash in the treasury, 1 Aug 1909, \$2,773,250.41, making a total of \$17,584,194.84. The expenditures were \$13,322,963.17, leaving a cash balance on 31 July 1910, of \$4,261,231.67. There were no invested fund accounts or permanent trust funds of the State opened up. It is estimated that the total of the invested funds of the State, when all the natural resources are converted into cash, contracts or bonds, will aggregate at least \$150,000,000. The balance includes the Minnesota Funding bonds of 1891, amounting to \$141,000, and 6 months' interest was paid 1 Jan 1910. The total issue was \$1,659,000. According to the special report of the comptroller of the currency obtained for the National Monetary Commission, Minnesota, for 1909, had 258 national banks with 80,961 depositors, having savings deposits of \$22,298,309.83; 672 State banks with 78,985 depositors, and \$102,000,000.58 in deposits; and 11 savings banks having, in 1910, 98,338 depositors, with \$24,491,871.02 deposits.

Religion and Education.—The leading religions, according to the last figures available, are the Roman Catholics, Lutheran, Methodist, Presbyterian, and Baptist. There are 378,288 members of the Catholic Church; 49,830 Lutherans General Council; 61,092 Lutherans Synodical Conference; 59,204 Lutherans United Norwegian Church; 9,656 Lutheran Joint Synod of Ohio; and 12,857 Lutheran Hague's Norwegian Synod, among other Lutheran bodies; 22,786 Baptists, Northern Convention; 46,351 Methodists; 26,412 Presbyterians; 18,763 members of the Protestant Episcopal Church; and 23,449 of other Protestant bodies, of which there are many.

The State has a permanent school fund of \$21,188,386.37, and a university fund of \$1,536,533.92. The receipts of the permanent school fund were \$1,506,493.37, and the disbursements, \$1,406,030.56. From the general school fund, the receipts were \$2,881,862.69, and the disbursements, \$1,897,140.17. The last figures showed 430,749 pupils enrolled in the common schools. The teachers number 14,430. The daily average attendance is 323,061. Minnesota had nine universities and colleges with 4,850 male and 2,167 female students, and 337 male and 59 female instructors. The value of their buildings is \$3,680,546, and the total income, \$1,687,665.

Charities and Corrections.—There are 74 institutions supported by individuals and ecclesiastical bodies and 12 by the State. The latter includes the insane asylums of the State, School for the Blind, School for the Feeble Minded, and School for the Deaf at Faribault, the State Public School at Owatonna, State Training School at Redwing, State Reformatory at St. Cloud, and State Prison at Stillwater. There are 37 private and 7 public hospitals, 2 private and 1 public dispensary, 15 private and 1 public orphanage, 3 day nurseries, 18 homes mainly for adults, a school for the deaf, and another for the blind. These figures do not include almshouses. The State Board of control, consisting of three members appointed by the Governor, has exclusive management of the State

Prison, State Reformatory, State Training School for Boys and Girls, the School for the Feeble Minded, the State hospitals, insane asylums, and the sanatorium for consumptives. The number of prisoners confined in the Minnesota State Prison at Stillwater, the beginning of the fiscal year 1910, was 706, of which 11 were women. The life prisoners numbered 90. This was an increase of 41 in prison confinement over the number shown two years ago. There were 86 prisoners on parole in Sept. 1910. During the past two years, there was a net profit of \$323,289.93 from the prison twine mills.

Legislation.—The legislature meets biennially and its sessions are limited to 90 days. No session was held in 1910, but in 1909 the body met and passed measures fixing the maximum freight rates and a number of other laws relating to the operation of railroads, restricting liquor licenses to 1 for every 500 of the population; prohibiting the sale of cigarettes, prescribing the form of policy for accident insurance; requiring sanitary places for laborers; regulating the labor of women and children, and creating a fund for the acquisition of land for reforestation. Compulsory insurance of employees against accidents was also considered at the session and a commission was appointed to investigate the subject.

History.—During the latter part of 1910 Secretary of the Interior Ballinger, by virtue of the restrictions in certain old treaties, issued an order prohibiting the sale of liquor in the Indian country of Minnesota. This has caused many wet spots, including even part of Minneapolis itself, to become dry. The enforcement of the law was largely brought about because of the intemperance of the Indians. The Indian treaties in question were executed between 1850 and 1865. Under them three-quarters of the total area of Minnesota was ceded to the United States. In six separate treaties it is declared that those portions of the laws of the United States prohibiting the introduction or traffic in ardent spirits, wines, or other liquors in the Indian country, should continue in force within the territory covered by such treaty until otherwise provided. Congress will be asked to amend the laws. The last campaign ended in the triumph of what is known as the Progressive wing of the Republican party. Even James A. Tawney, chairman of the Committee on Appropriations in the House of Representatives and one of the conservative Republican leaders, met defeat at the primaries for renomination.

Minute Men Memorial. President Taft has given his approval of the project of the "Lexington Minute Men" to erect a memorial armory to mark the battlefield of Lexington as the "birthplace of American Liberty." In a letter to the association the President said: "It seems to me that the erection of such a memorial will be most appropriate. I am deeply interested in the work and hope for its ultimate success, and that you will succeed in raising a fund large enough to build a suitable armory, not only as a memorial, but one that will be useful to the State as well." Carnivals and the like are to be held during 1911 for the benefit of the fund. Mrs. Taft heads the list of patronesses, the governor and all the living ex-governors of Massachusetts are patrons; the military officers

MIQUELON — MISSIONARY CONFERENCE

have interested themselves, and the patriotic societies have joined in the work of building the memorial at the birthplace of the American nation. It is planned by the memorial armory committee to give the members of patriotic associations of every sort representation in the project.

Miquelon. See ST PIERRE AND MIQUELON.
Miracle Plays. See PASSION PLAY.

Miracles. There can be no doubt that a belief in the reality of miracles is decreasing from year to year. Although an actual census has never been taken, showing the number of those who believe in miracles and those who do not, it would certainly be found that the number of believers is falling off from year to year; and that the number of non-believers is steadily gaining. Indeed, it may be said that the pendulum has swung almost too far in this direction; and that the present materialistic tendency of the age is to deny everything which does not come directly under the scrutiny of the senses. This, of course, is unjustifiable. Science accepts many facts which, to the outsider, would seem miraculous. There is a tendency to regard as "impossible" all that is not usual or uniform, or contrary to the experience of every-day life; but this cannot be accepted as a standard of evidence. The old definition of "miracle" was, anything which directly contravenes the laws of nature; and in this sense hardly anyone at the present day could be found who accepts them. Phenomena may occur which extend or enlarge our conceptions of "the possible;" or of the "laws of nature;" new laws are constantly being discovered. At the same time, there are certain fixed laws which it seems improbable will ever be broken, and any phenomena occurring contrary to these laws may, in a sense, be considered "miraculous."

These remarks are rendered necessary for the reason that, according to the belief of many, miracles are still occurring — at Lourdes, over the remains of saints, in answer to prayer, etc. A recent case of this character, which created no little stir and comment, and reawakened the question of the possibility of miracles was that of the liquification of the blood of St. Januarius (in a sealed tube), which took place in the Cathedral at Naples. After prayers lasting 45 minutes, the miracle occurred. It was interpreted as a sign that the cholera would abate forthwith.

St. Januarius was Bishop of Benevento. He suffered martyrdom during the reign of Diocletian and "his blood was gathered from the ground by a faithful peasant woman and enclosed in two glass phials" (?). These vessels are kept in the tabernacle of the high altar of the chapel of St. Januarius, in the south aisle of the Cathedral of Naples. According to the legend, the martyr's blood liquified for the first time when the body of the saint was taken to Naples by Bishop St. Severus. This was in the time of Constantine.

There are two regular days set aside annually for the supposed miracle. These are, 19 September and the first Saturday in May. At one of the expositions of the blood of the saint last year it failed to liquify. The bubonic plague is believed to have fulfilled the prediction of disaster. No explanation of the alleged

miracle has ever been made. It was contended some time ago that there was no actual liquification, but — it is said — overwhelming evidence that the liquification really took place forced the abandonment of this theory.

Immediately upon the announcement of the last miracle, however, Professor Caréne, a Catholic, who holds the chair of experimental chemistry at the French College of Cette, came forward with a demand for fresh and rigid scientific control of the miracle. Provided with a letter of recommendation from the Archbishop of Avignon, he approached Cardinal Prisco, Archbishop of Naples, and the Prince of Piedmont, and requested their cooperation. Both refused but promised their consent if the Pope should agree. A letter was accordingly addressed to the Pope, but he refused his permission, on the ground that the miracle had already been amply proved; that, if he granted this request, he would be compelled to grant others of a similar character; and finally, it "would be tantamount to throwing doubt and discredit upon the good faith and ability of the Neapolitan scientists." The miracle, therefore, is still *sub judice* for the scientific world; and seems to rest chiefly on faith.

In this connection one fact is of great importance. It is that at a recent meeting of the Presbyterian Synod, it was agreed that clergymen of this denomination need not accept miracles as a part of their creed or belief. This may have been in a measure due to a letter from Mr. Bolton Hall, a well-known Presbyterian, in which he urged that miracles should no longer be considered a part of the faith of every church member.

Missionary Conference, World. The World Missionary Conference, held at Edinburgh, 14-24 June 1910, was the third in a series of great international gatherings convened for the purpose of discussing and furthering missionary enterprise. The first of these was held at London in 1888, the second, known as the Ecumenical Missionary Conference, in New York in 1900.

In preparation for the Edinburgh Conference the International Committee met at Oxford in 1908 and appointed eight commissions to make exhaustive investigation of missionary methods and results and to prepare reports. These commissions, consisting of about twenty experts each, were: (1) On Carrying the Gospel to all the Non-Christian World, chairman, John R. Mott; (2) The Church in the Mission Field, chairman, Rev. J. Campbell Gibson, D.D.; (3) Education in Relation to the Christianization of National Life, chairman, Rt. Rev. Charles Gore, D.D.; (4) The Missionary Message in Relation to Non-Christian Religions, chairman, Rev. Prof. D. S. Cairns, D.D.; (5) The Preparation of Missionaries, chairman, Rev. Prof. W. Douglas Mackenzie, D.D.; (6) The Home Base, chairman, Rev. James L. Barton, D.D.; (7) Missions and Governments, chairman, Lord Balfour of Burleigh; (8) Cooperation and Unity, chairman, Sir Andrew H. L. Fraser. Each of these eight commissions prepared a printed report which formed the basis of the discussions of the Conference. Each also suggested an outline to be followed in the debates that the most might be made of the brief time at the disposal of the delegates.

The basis of representation was the income

MISSIONARY CONFERENCE — MISSIONARY MOVEMENT

of each participating society for its work among non-Christians. As a result of this schedule about 500 seats were assigned to North America, 500 to Great Britain, and the remainder, about 200 seats, to the Continent of Europe, and to Australia, New Zealand, and South Africa. Simultaneously with the sessions of the Conference, held in the United Free Church Assembly Hall, a secondary conference met in the Synod Hall, to which the delegates had been appointed on the same basis. The total number of American delegates thus numbered nearly 1,000.

Lord Balfour of Burleigh was made president of the Conference, and brought greetings from the newly crowned king, George V. The Archbishop of Canterbury and Dr. Robert E. Speer, delivered addresses at the first session, following the introductory speech of Lord Balfour. One of the most interesting events was the reading of a letter from Theodore Roosevelt, who had been appointed a delegate from the Dutch Reformed Church of America, but who was compelled to leave Great Britain before the assembly met. The Hon. William Jennings Bryan sat as a delegate in the Conference, as did also the Hon. Seth Low of New York.

The University of Edinburgh recognized the unique character and importance of the gathering by holding a Special Honorary Graduation Ceremonial at which degrees were conferred upon fourteen of the delegates. Five of the 14 men thus honored were Americans. Mr. Robert E. Speer, and Rev. W. Douglas Mackenzie, who received the degree of Doctor of Divinity, and Hon. Seth Low, General James A. Beaver, and Mr. John R. Mott, who were given the degree of Doctor of Laws.

The report of the Commission on Carrying the Gospel to all the non-Christian World, stated that 388 organizations were maintaining missionaries, and that 450 other societies were cooperating with these organizations. The total sum collected by these societies in the year 1907 was \$24,676,580. Ninety-six of the main societies and 108 of the secondary organizations have their headquarters in the United States and reported, in 1907, a total income of \$9,013,376. The number of missionaries in the field was 19,280, including physicians and lay missionaries. In addition to these workers sent from Christian countries there were 5,045 ordained native workers and 92,918 lay native mission workers.

The total number of communicants in mission churches was 1,925,205, of whom 127,875 were added in the single year, 1907. Since in many Protestant churches baptized children are not reckoned as communicants, the number of baptized Christians of all ages is much larger than the number of communicants. The whole number of baptized Christians was reported as 3,006,373 and the whole number of native Christian adherents, baptized and unbaptized, of all ages, was 5,281,871. The native contributions amounted, in 1907, to \$2,650,551. The commission estimated that, including the work of the Roman Catholic and Russian Orthodox churches the total number of living converts in non-Christian lands, who were themselves won or whose ancestors were won to Christianity during the present century, is 21,000,000.

In the report of the Commission on The

Home Base, and the discussion following, special attention was given to the Laymen's Missionary Movement (q. v.), carried on during the last two or three years in the United States and Canada with such striking results. The record of the experiences and achievements of this movement was recognized as one of the most important contributions to the findings of the Conference.

It is generally conceded that the most important result of the Edinburgh Conference is the closer understanding and deeper sympathy between the various denominations represented in this 10-day council. It may fairly be questioned whether ever before so frank, so direct, and so brotherly a debate was held concerning the things that divide and the advantages of cooperation and unity. Strong men with strong convictions spoke the full content of mind and heart.

A few paragraphs from the message of the Conference to the "Brethren of the Church in Christian Lands" may serve to indicate some further results of the deliberations. "Our survey has impressed upon us the momentous character of the present hour. We have heard from many quarters of the awakening of great nations, of the opening of long-closed doors, and of movements which are placing all at once before the church a new world to be won for Christ. The next 10 years will in all probability constitute a turning-point in human history, and may be of more critical importance in determining the spiritual evolution of mankind than many centuries of ordinary experience. If those years are wasted havoc may be wrought that centuries are not able to repair. On the other hand, if they are rightly used they may be among the most glorious in Christian history.

"We have, therefore, devoted much time to a close scrutiny of the ways in which we may best utilize the existing force of missionary enterprise by unifying and consolidating existing agencies, by improving their administration and the training of their agents.

"It is not only of the individual or the congregation that this new spirit is demanded. There is an imperative spiritual demand that national life and influence as a whole be Christianized so that the entire impact, commercial and political, now of the West upon the East, and now of the stronger races upon the weaker, may confirm, and not impair, the message of the missionary enterprise."

Two further deliverances of this influential body are worthy of special note. In the report of the Commission on Cooperation and Unity occurred this telling sentence: "While the right of a convert to pass from one Christian body as the result of an honest change of conviction must be recognized, any attempt to proselytize among the Christians of another denomination is fatal to effective and harmonious work." And the finding of the Commission on the Missionary Message in Relation to non-Christian Religions, ratified by the Conference, contained this succinct statement: "We believe that, scientifically regarded, the facts bear out the view that Christianity is the one absolute and final religion."

Missionary Movement, Laymen's. See LAYMEN'S MISSIONARY MOVEMENT

Missionary Movement, Young People's. See YOUNG PEOPLES' MISSIONARY MOVEMENT.

MISSISSIPPI — MISSOURI

Mississippi. One of the East South Central States having a population, in 1910, of 1,797,114, which is an increase of 245,844 or 15.8 per cent over 1900. The population per square mile is 38.8. The area is 46,810 square miles, 470 being water. Jackson is the capital.

Agriculture.—Mississippi is the 5th cotton-ginning State of the South. For 1910, there were 1,066,216 running bales, counting round as half bales and excluding linters, ginned. This is an increase over 1909, but does not equal 1908, when the figures reached 1,441,947. For 1909-10 the cotton crop of Mississippi was 1,137,000 bales. According to the 'Crop Reporter,' issued by the Secretary of Agriculture, of the acreage, production, and value of important farm crops of the United States in 1910, Mississippi produced 66,256,000 bushels of corn on an average of 3,232,000, valued at \$41,741,000; 70,000 bushels of winter wheat on an acreage of 5,000, valued at \$81,000; oats, 3,360,000 bushels, on an acreage of 175,000, value, \$1,848,000; rice, 84,000 bushels, acreage, 2,800, value, \$59,000; potatoes, 765,000 bushels, acreage, 9,000; value, \$719,000; hay, 142,000 tons, acreage, 100,000, value, \$1,732,000; tobacco, 55,000 pounds, acreage 100, value, \$11,000. The farm animals of the State on 1 Jan. 1910, were horses, 265,000, value, \$22,525,000; mules, 290,000, value, \$32,770,000; milch cows, 330,000, value, \$7,755,000; other cattle, 577,000, value, \$4,847,000; sheep, 171,000, value, \$325,000, and the number of sheep of shearing age, 1 April 1909, 150,000; wool, washed and unwashed, 600,000; and wool scoured, 348,000. There were, on 1 Jan. 1910, 1,290,000 swine of the value of \$7,095,000.

Mining and Manufactures.—The last available figures give the value of the mineral products of Mississippi at \$974,518. Coal and clay products, mineral water, gravel and sand-lime brick. The clay products were valued at \$828,739, and are the most important. The manufactures show a total capital employed of \$60,256,309, wage-earners, 38,690; the wages paid, \$14,819,034, and the value of the products, \$57,451,445.

Fisheries.—The value of the products, by the latest reports, was \$556,174. The commissioner of fisheries has recommended the establishment of additional stations for the rescue of fishes from overflowed lands in the Mississippi Valley. It is believed that millions of fishes now left annually by the receding waters to die of exposure can be saved in this way. These are oysters, shrimp, buffalo, catfish, menhaden, millet, bass, trout, crabs and paddle fish. The following quantities were taken. Oysters, 1,067,600 bushels, value \$259,340; shrimp, 4,120,500 pounds, value \$80,540; buffalo, 1,663,900 pounds, value \$34,470; catfish, 502,100 pounds, value \$19,480; menhaden, 3,149,300 pounds, value \$3,950; mullet, 1,035,400 pounds, valued at \$19,510.

Government.—The Governor of the State is Edmond F. Noel, Democrat, salary \$4,500 a year, whose term expires 18 Jan. 1912. Luther Manship, Lieutenant Governor; J. W. Power, Secretary of State; and George E. Edwards, Treasurer. The Legislature is wholly Democratic in both branches. Mississippi is represented in the United States Senate by Leroy Percy and John Sharp Williams, both Democrats, and in the House of Representatives by E. S. Chandler, Jr., H. D. Stephens, Benjamin G.

Humphreys, Thomas Upton Sisson, S. A. Witherspoon, B. P. Harrison, William A. Dickson and James William Collier.

Finance.—The bonded debt of the State in 1909 was \$3,589,226. The annual receipts for 1908-09 were \$3,307,617, and disbursements, \$3,131,680. The assessed valuations were: real property, \$222,624,869; personal, \$112,539,367; railroads, \$48,659,504. According to the latest statistics, at this writing, furnished by the Comptroller of the Currency for the National Monetary Commission, there were 30 National banks with 3,810 depositors and \$1,269,597.50 deposits, 146 State banks, having 20,092 depositors and \$4,149,233.11 deposits, and 4 private banks, with 9 depositors and \$10,500 deposits. For 1910, there were 8,558 depositors with deposits of \$1,751,262.62 in the savings banks of the State.

Religion and Education.—The Baptist is the prevailing religion. There are 131,284 male and 221,967 female Baptists. The Methodists come next, there being 73,955 male and 113,297 female members. The Roman Catholics number 10,951 male and 12,186 female members. The Presbyterians are 8,247 male and 11,927 female members. The grand total of educable children are 712,044, of which 310,548 are white, 410,089 negro, and 407 Indian. In the State there are 221,392 white and 238,639 colored children enrolled in the schools. There are 9,651 teachers, of which 3,552 are colored. The total school receipts for the State were \$3,164,542.16, and the disbursements, \$2,756,082.45.

Charities and Corrections.—Exclusive of almshouses, there are 17 charitable institutions, 13 of which have been provided by private persons or ecclesiastical bodies. The State Institutions are the State Charity Hospital at Vicksburg, the Confederate Hospital at Natchez, the same place; the Natchez Hospital at Natchez; the Eastern Mississippi Insane Asylum, Deaf and Dumb Institution and Institution for the Blind.

Legislation.—The Legislature meets biennially, and the session is unlimited. It met in 1910 and passed acts creating county agricultural high schools, forbidding misbranding and adulteration of food and drugs, requiring practicing physicians under penalty of \$10 to \$50 to report certain diseases to the Board of Health, punishing drunkenness and disorder on trains, and changing the common law rule by an act declaring that contributory negligence shall not bar recovery for injury or death, but may be submitted to the jury in mitigation of damages.

History.—Much attention has been directed to the growth of Mound Bayou (q.v.). It is 30,000 acres of land on the Yazoo and Mississippi Valley Railroad, half way between Vicksburg and Memphis. All the land is owned by negroes. Mound Bayou is the first negro town built in America. The situation between the State and the railroads and the anti-trust agitation has not been as acute as in 1909. Cotton planters suffered much during 1910 from the boll-weevil ravages of 1909. This brought about an extensive migration of negroes.

Missouri. A State of the West North Central division with an area of 69,430 square miles. According to the 1910 census, it has a population of 3,293,335, a gain of 427,480 or 16.0 per cent over 1900. The population per square mile



MISSOURI

is 47.9. Missouri is the 7th State in size. Its capital is Jefferson City, having a population of 11,850.

Agriculture.—The total value of farm land alone for 1910 is \$1,441,529,000, an increase of 107 per cent over 1900; the value of land and buildings, \$1,710,505,000, an increase of 103 per cent; the value of buildings alone, \$268,976,000, an increase of 81 per cent; the value of implements and machinery, \$50,769,000, an increase of 78 per cent; improved acreage, 24,528,000, an increase of 7 per cent, and the total acreage 34,516,000, an increase of 2 per cent. During 1910, the expenditures for labor were \$18,526,000, an increase of 89 per cent over 1900, and for fertilizer, \$662,000, an increase of 78 per cent. The total number of farms operated in 1910 by owners, part owners, and owners and tenants, comprising the "all owners" class, was 191,563. This is a decrease of 4,595 over the figures for 1900. The important farm crops in point of acreage, production and value of Missouri for 1910 according to the December figures put forth by the Secretary of Agriculture were as follows: corn, 273,900,000 bushels, acreage, 8,300,000, value, \$120,516,000; winter wheat, 25,130,000 bushels, acreage, 1,821,000, value, \$21,863,000; oats, 26,208,000 bushels, acreage, 780,000, value, \$3,387,000; barley, 54,000 bushels, acreage, 2,000, value, \$32,000; rye, 210,000 bushels, acreage, 14,000; value, \$158,000; buckwheat, 33,000 bushels, acreage, 2,000, value, \$29,000; flaxseed, 168,000 bushels, acreage, 20,000, and value, \$353,000; potatoes, 7,912,000 bushels, acreage, 92,000, value, \$5,380,000; hay, 3,510,000 tons, acreage, 2,700,000, value, \$32,292,000; tobacco, 7,875,000 pounds, acreage, 7,500, value, \$945,000. In 1910, there were 44,993 running bales of cotton counting round as half bales and excluding linters ginned.

Mining and Manufacturing.—The mineral products of the State are valued at \$50,000,000 in round numbers. Zinc and lead are the most important. They are equal in extent of productiveness. Clay is also an important product, the production for the last year on which figures are available being \$5,631,456. The iron ore production is in excess of 100,000 tons. The coal fields have an area of about 14,000 square miles and employ 9,000 men. There were 4,350,000 tons of bituminous coal mined of the value of \$6,916,500. The extended use of petroleum and natural gas in the mid-continental fields in addition to the general business depression caused a decrease in the production of coal. In addition, the State produces building stone, cement, lime-rock, gravel, glass-sand, mineral waters, sulphur, and barytes.

The manufacturing industries of Missouri have to do with the agriculture and forestry of the State. The total capital employed in the manufactures was \$379,368,827, the value of the products, \$439,548,957, the wage earners, 133,167, and the wages paid, \$66,644,126. Brewing is a leading industry. The capital invested is \$50,000,000 in round numbers. The capital employed in tobacco manufacturing is in excess of that sum.

Government.—The Governor is Herbert S. Hadley, Republican, salary \$5,000 a year, whose term expires in 1913; Lieutenant-Governor, J. F. Gmelich, Rep.; Secretary of State, Cornelius Roach, Dem.; Auditor, John P. Gordon, Dem.; Treasurer, James Cowgill, Dem.; Attorney-General, Elliott W. Major, Dem. The Legisla-

ture stands as follows: Senate—Democrats, 22; Republicans, 12; House—Democrats, 82; Republicans, 60. Missouri is represented in Congress as follows: Senate—William J. Stone, Dem. No colleague chosen at this writing. House—James T. Lloyd, Dem.; William W. Rucker, Dem.; Joshua W. Alexander, Dem.; Charles F. Booker, Dem.; William P. Borland, Dem.; Clement C. Dickinson, Dem.; Courtney W. Hamlin, Dem.; D. W. Shackelford, Dem.; Champ Clark, Dem.; Richard Bartholdt, Rep.; Theron F. Catlin, Rep.; L. C. Dyer, Rep.; Walter L. Hensley, Dem.; Joseph J. Russell, Dem.; J. A. Daugherty, Dem.; and Thomas L. Rubey, Dem.

Finance.—The bonded debt of the State according to the last available figures was \$4,398,889. The value of the real property in the State was \$1,059,345,946; the personal property, including railroads, \$487,780,800; and the total assessed valuation, \$1,547,126,736. According to the figures obtained by the Comptroller of the Currency, there are 118 National banks with 21,139 depositors, having \$9,819,993.97 in deposits; 730 State banks, having 50,272 depositors and \$17,506,610.35 deposits; and private banks with 15,321 depositors and \$548,268.31 deposits. There are 34 loan and trust companies with 131,823 depositors and \$21,305,946.14 deposits.

Religion and Education.—The Roman Catholic is the prevailing religion in numbers. There are 177,380 male and 181,065 female members. The Methodist bodies comprise 73,446 male and 121,647 female members. There are 79,691 male and 124,438 female Baptist members. Disciples or Christians number 62,878 male and 96,561 female; the Lutherans, 17,558 male and 20,484 female. The annual expenditures for education amounted to \$13,512,691.87 and the receipts \$17,148,214.05. The children of school age number 1,005,092. For the fiscal year ending 30 June 1909, there were 206 buildings erected, costing \$2,622,318.12.

Charities and Corrections.—There were 8,777 persons in State institutions on 1 Jan. 1909. Of this number, however, 2,968 were in penal. The last available figures show 3,295 paupers, 509 feeble-minded, 338 epileptics, 95 blind, 290 sick or crippled, and 140 paralytics. The County Court has jurisdiction over the care of paupers in each county. The last available figures of the State penitentiary showed 3,702 male and 97 female inmates. Its support including salaries, food, and even clothing for the convicts amounted to \$621,164.91. The earnings from the penitentiary, exclusive of the binding twine plant, were \$597,776.56.

Legislation.—The Legislature meets biennially and its session is limited to 70 days. There was no session in 1910, but in 1909, the Legislature met and proposed an amendment to the constitution providing for the initiative and referendum and passed laws creating a bureau of dairying and extending the course in agriculture under the direction of the State University; making Columbus Day, 12 October, a legal holiday; nullifying in effect, the arbitration clauses of insurance policies; requiring railroad employees to be paid on or before the 15th day of each month after the month the services are rendered in; appointing the Judges of the Kansas City Court of Appeals, commissioners to prepare syllabi of their opinions and paying them \$1,000 per annum for this, estab-

MITOKINETISM — MODEL TENEMENTS

lishing a third Court of Appeals at Springfield; creating a juvenile court for all counties having an excess of 50,000; prohibiting divorce advertisements; adopting a pure food law and also a comprehensive one for collecting and preserving vital statistics; regulating inns for the purpose of sanitation and dealing with education at great length

History—The liquor question was an important one in the State during 1910. There was an amendment to the constitution for State-wide prohibition which had to be voted upon. Under the present local option law, 70 counties out of 114 are entirely dry and 12 more with the exception of the county seat come in the same category. The German vote was cast against the amendment. In addition the cities, notably St. Louis where the brewing interest was great, did the same. It was only the rural districts that supported the amendment. The United States Supreme Court in May 1910 declared unconstitutional, the Missouri statute passed 13 March 1907 under which foreign corporations were prohibited from doing business in the State if they sought litigation in the Federal courts. The ground of its being unconstitutional was that the act discriminated against foreign corporations by allowing resident companies to sue in Federal courts where Federal questions might be involved; because it denied to foreign corporations rights granted under the Federal constitution and impaired the contract agreement of 1870 whereby foreign corporations were promised the same protection of the law by the State as local ones. David J. Ranken, Jr., one of the wealthiest citizens of St. Louis, and founder of the David J. Ranken, Jr., School of Mechanical Trades, deeded his entire fortune estimated at \$3,000,000 for use in the maintenance and enlargement of this institution. This will make it one of the largest schools of its kind in the world.

Mitokinetism. See LIGHT.

Model Tenements. The first decade of the 20th century has seen a remarkable change in the housing laws of the larger cities and a much keener interest on the part of the public in the question of what it has a right to demand of the landlord. The tenement, with its evils of over-crowding, wretched sanitary conditions and rapacious landlords has been a growing menace in most cities. The term tenement-house usually means a building occupied by three or more families; very often it is an old dwelling, originally designed for occupancy by one family only and therefore lacking in decent, healthful sanitary accommodations for the number of families that are crowded into it.

In many cities public opinion has brought about the legislation which is necessary for permanent bettering of the conditions. Some of the cities which have been most active in this work are New York, Boston, Chicago, Washington, Pittsburg, Jersey City, and Rochester. The first prime need to be met in all tenement-housing reform is the establishment of better sanitary regulations. A notable case in point is the work that was done in Pittsburg in 1908 by the investigation known as "The Pittsburg Survey." At the head of the branch of the Survey which had to deal with the housing problem was Mr. Lawrence Veiller, the foremost authority on housing reform in this country. It was Mr. Veiller who prepared in 1900, in

New York City, the first tenement-house exhibition ever held and it was due largely to his efforts that the legislature of New York State authorized in 1900 the appointment of the Tenement-House Commission.

By means of the investigation in Pittsburg many facts were discovered which aroused public alarm and brought about the passage of some much-needed laws and ordinances. The most important ordinance was the one aimed at the most threatening sanitary evil—an evil that prevails in many cities where population has increased at a greater speed than civic surveillance. This ordinance called for the abolishment of all privy vaults. The fact that Pittsburg up to the year 1908 had a higher typhoid death rate than any other city was largely due to the existence of these vaults. Other new laws passed by Pittsburg were those regulating the building of new tenements. By these it is stipulated that a new house may not be built for tenement uses unless it has a separate sink for every suite of rooms, and a water-closet for every suite, or where suites consist of but one or two rooms, a closet for every three rooms. Every room in a tenement must have a window equal in size to one-tenth of the floor area of the room and opening on a street, yard or court with a sectional area of not less than twenty-five square feet, or else the room must have a fifteen-foot square window opening to an adjoining outside room in the same apartment.

The new building code of Cleveland, Ohio, is much stricter than that of Pittsburg, providing more carefully for the circulation of air, the lighting of the rooms, the size of air-shafts, the size of courts, yards, etc.

In Pittsburg there is only one "model" tenement; this is a five story building called "The Franklin Flats," and built by the Tenement Improvement Association of Pittsburg. In Allegheny the Phipps Model Tenement was erected in 1908. It is built on a corner and is well lighted; part of the ground floor is used for shops. In this building four-room apartments rent from \$4.25 to \$5 a week. In each flat steam heat is provided, also a gas slot meter, kitchen sink, and water closet.

New York City offers the most difficult problems of tenement housing which are being handled by the New York City Tenement House Department, a new branch of municipal government, established in 1901. This department assumes full charge of the tenement-houses, taking unto itself duties that before its existence were divided among the Board of Health, Building Department, Fire Department, and Police Department, with the result that responsibilities so much divided were neglected. When the Tenement House Law of 1901 was passed its provisions affected not only the building of new tenements but the improvements in the 80,000 and more old tenements. One of the improvements demanded was that dark, interior rooms must be lighted and ventilated; if in no other way than by the cutting of large windows into adjoining rooms. During the first eight years of the department's existence it accomplished the lighting of 64,000 dark rooms, besides attending to many other problems and reforms.

The first model tenement association in New York City was formed in 1896 and grew out of the work of the Association for Improving

MODEL TENEMENTS—MODERNISM

the Condition of the Poor. This model tenement association was called the City and Suburban Homes Company, Dr. E. R. L. Gould was made its president. In 1909 the Association reported itself as owning five large groups of tenement buildings and one group of cottages. The properties pay 4 per cent or more.

By the Tenement House Law of 1901 all halls and rooms in new houses must have light and air. Before the law was passed air-shafts less than two feet wide were built to give light and ventilation to the 15 or more rooms opening on it. Of course only the rooms on the top floor had light but they all had the poisonous odors and the germ-laden air. Now the law requires inner courts, which must be at least $12\frac{1}{2}$ by 25 feet, with a tunnel at the bottom which extends out to the street or opens into a yard and which gives a current of fresh air. Individual sanitary accommodations are required for each family and cellar walls and floors must be made fireproof.

The erection of several model tenements has been successfully carried out by philanthropists of large means and their financial success has been gratifying. It has been proved that they are not run at a loss but pay a small per cent on the investment. Among the most successful of these are The Foote Tri-Court Tenement; the D. O. Mills Hotels for men; The Misses Stone's model tenements, Mrs. Frederick S. Lee's buildings, and the Phipps' model tenements.

The latter are notable for their artistic design, their beautiful roof gardens, with trellises, flowers, summer houses, and fountains, all of which make an ideal place for the babies and children to play and for the mothers and fathers to get cool, fresh air in the hot summer evenings. The apartments have three, four and five rooms, and most of them have a private hall. They are furnished with a gas slot meter, sink, water closet, gas range, cupboards and closets. Every room has outside light. There is no bath tub but the little room containing the water closet has a cement floor, with an escape for water in the centre; from the wall about four feet from the floor, there projects a large faucet with hot and cold water; this gives an excellent shower bath. The tenements are not allowed to have wall-paper on the walls of their flats but the landlord is generous about keeping the rooms in good condition and painted in soft tones of cream and buff. The prohibition of wall-paper is a great safeguard against one of the pests of New York City tenements, bed-bugs. The halls and stairways are fireproof; the large entrance halls on the first floors of the two buildings are extremely attractive with columns of soft gray stone, large red tiles and pots of growing plants. The rents in these model tenements are from \$4.50 a week for the three rooms and hall apartments, to \$6.50 a week for the five-room apartments.

Before the year 1915 the Vanderbilt sanitary apartments will be completed; these are to have special open-air features such as open loggias and outside stairways. These apartments will be occupied by families in which the scourge of tuberculosis has made its appearance. Another model home plan that will probably be in operation by 1915 is the one to be built by Mrs. Russell Sage at Forest Hills, a suburb of New York City. These homes are

to be cottages and are designed for people of more refinement than the so-called laboring classes. Trinity Church Corporation is interested in extensive improvements in the tenement houses which it controls. The second decade of the present century is destined to see many long-desired and radical improvements in the housing conditions of the congested quarters of all our large cities.

Modernism, Pope Pius X on. In a recent utterance, Pope Pius X enunciated the following doctrines,—circulated by the Catholic press,—as his *Motu Proprio*. He deals with the "modernist" movement and propaganda, and, speaking of it, laid down the following conditions and regulations, which he ordered Catholics to follow. He said in part

"In the first place, as regard to studies, we shall not ordain that scholastic philosophy be made the basis of the sacred sciences. It goes without saying that if anything is met with among the scholastic doctors which may be regarded as an excess of subtlety, or too carelessly stated; if there is anything which does not square with later discoveries, or which is altogether destitute of probability, we have no desire whatever to propose it for the imitation of present generations. And let it be clearly understood above all things that the scholastic philosophy we prescribe is that which the angelic doctor has bequeathed to us In the vast and varied abundance of studies opening before the mind desirous of truth, everybody knows how the old maxim describes theology as so far in front of all others that every science and art should serve it and be to it as handmaidens. . . . Anyone who in any way is found to be imbued with modernism is to be excluded without compunction from these offices, and those who already occupy them are to be removed Equal diligence and severity are to be used in examining and selecting candidates for holy orders It is also the duty of the bishops to prevent writings infected with modernism, or favorable to it, from being read when they have been published, and to hinder their publication when they have not. No book or paper or periodical of this kind must ever be permitted to seminarists or university students The Holy See neglects no means to put down writings of this kind, but the number of them has now grown to such an extent that it is impossible to censure them all It is forbidden to secular priests, without the previous consent of the ordinary, to undertake the direction of papers or periodicals Let priests hold as sacred the authority of their prelates, let them take it for certain that the sacerdotal ministry, if not exercised under the guidance of the bishops, can never be either holy, or very fruitful or without blemish. . . . It is impossible to approve in Catholic publications of a style inspired by unsound novelty which seems to deride the piety of the faithful and dwells on the introduction of a new order of Christian life, on new ordinances of the Church, on new aspirations of the modern soul, on a new vocation of the clergy, on a new Christian civilization Ancient relics are to retain the veneration they have always enjoyed, except in those individual instances when there are clear arguments that they are false.

Molokane. In October 1910 steps were taken to start what promises to be the most remarkable and at the same time one of the largest communistic ventures in the United States. The ground selected is situated in southern California. The movement is engineered by the Molokane, a band of religious exiles from Russia, at present resident in Los Angeles, Cal. This organization, which numbers several thousand families, all of which are entirely dependent upon manual labor for their subsistence, has saved \$900,000 for the purchase of a ranch and orchard lands and the equipment of a large agricultural undertaking. Negotiations are now under way for the purchase of 667,000 acres near San Diego. Most of the work of organization is due to Paul Cherbak, a former wealthy aristocrat of St. Petersburg, whose fortune was confiscated by the Russian Government some years ago, when he became a political exile, and one of the closest friends of Tolstoy. The new colony will have a unique form of government, founded upon the old patriarchal family system. The man wisest by virtue of age, experience, or training will be elected chief and occupy a position similar to both mayor and judge, though his office will be more like that of a presiding elder than of a civil officer, for the Molokane is composed of profoundly devout people. Despite the latter fact, however, it maintains no churches, clergy, or priests. It holds prayer meetings from house to house instead. A certain allotment of land will be made to each family making one of the community, and schools will be immediately erected. It is planned to open formally the new colony sometime during 1912.

Monaco. A small kingdom in southern Europe, between France and Italy, and bordering on the Mediterranean Sea. The whole area is only about $4\frac{1}{2}$ square miles in extent, and is entirely over-built. There are three cities, viz Monte Carlo, the gaming-house of the world; La Condamine, and the town of Monaco. The population is about 16,000, and there are annually 1,250,000 visitors approximately. The ruler of the realm is Prince Albert, who was born in 1848, and succeeded to the throne at the age of 41. His heir, Prince Louis, was born in 1870. There are a Governor-General and a Secretary, for the immediate administration of the affairs of the principality.

History, 1910 — The principality of Monaco on the Mediterranean, which is practically given over to gambling and the entertainment of visitors, demanded a constitution of the Prince of Monaco in Oct 1910, and secured it after a bloodless revolution. The whole affair came dangerously near the use of bombs, but passed off peaceably. At the bottom of the uprising, which appeared to have little cause, as the people are not taxed, was the thwarted ambition of a well-known European gambler to secure a directorship in the company which operates the gambling house at Monte Carlo. Securing a thousand shares, he attempted to secure the position, but was refused by everyone. In revenge he was able to incite a revolt, which, once under way, soon became large enough to include all the 1,500 inhabitants of the principality. They demanded that a national assembly be created and the national treasury be handed over to it for regulation, agreeing to allow the

Prince \$800,000 a year. The Prince treated the matter lightly when the delegation waited on him and agreed to give them a hearing in Brussels, but they sent word that they must be answered within two days in Monaco or events would take a more serious turn. Crown Prince Louis then appeared, and with the consent of his father, made the concession. The first assembly will have only 18 members, but they will have considerable financial responsibility, as the income from the gambling house at Monte Carlo is very large.

The gambling syndicate which controls the enterprises at the Casino, was granted its original charter in 1863, for a term of 50 years, and it was prolonged in 1882 to 1945. The charter requires the company to furnish the Prince with an annual income of \$250,000, and 8 per cent of the gross surplus proceeds from the tables above \$5,000,000. This made the Prince's total income from the gambling about \$1,000,000 a year. In addition, the company paid the Prince a lump sum of \$2,000,000 in 1882, and will be compelled to pay \$3,000,000 in 1914. In addition, the gambling concern pays all public expenses and all the officials who are French.

The effect of this revolution may eventually be the closing of the gambling house. The revolutionists are of the opinion that the principality, as far as its citizens are concerned, would be much better off if the gambling house were closed and all connected with it were driven out of the country. They believe that it would then become a popular winter resort. The wealthy gamblers who control the situation are, however, well entrenched, and might be able to hold their own and prevent international intervention. They and their employees number 15,000 against the 1,500 Monagasques.

Edmond Blanc, son of the original concessionaire, on account of his wealth, was able to secure an alliance for his daughter with Prince George of Greece and there are men financially interested in the casino in most of the European courts. The concessionaires have found it to their advantage to control European public sentiment in this manner and have been able to withstand all attacks made on them. They have treated the revolt rather lightly, but there is possibility of its proving their final undoing.

Monaghan, John James, R. C. bishop. b. Sumter, S. C., 23 May 1856. He attended St Charles College, Md, 1872-76, and completed his theological course at St. Mary's Theological Seminary, Baltimore, Md, in 1880, and was ordained priest at Charleston, S. C., 19 Dec 1880. He was assistant priest at St. Joseph's Church, and later at St. Patrick's Church, Charleston, was rector at Greenville, S. C., 1882-87; pro-rector at the Charleston Cathedral, and chancellor of the diocese, 1887-88, assistant to the vicar-general of St. Patrick's, Charleston, 1888-97, and on 9 May 1897, he was consecrated bishop of Wilmington, Del, in the Pro-Cathedral, Wilmington, by Cardinal Gibbons, assisted by Bishops Curtis and Northrop.

Money, New Process for Restoring Paper. During June 1910, an innovation was introduced into the United States Bureau of Engraving and Printing which will mean an annual saving of about \$1,000,000 to the country. The new departure is the washing of

MONACO.



THE HARBOR OF MONACO,
Showing the New Oceanographic Museum at the Tip of the Mainland

money. For many years past the department has been in the habit of redeeming and destroying nearly \$2,000,000 in paper money each day. Most of these bills were of the one and two-dollar denominations. The destruction of these bills was formerly imperative, for, not only did bank depositors refuse to handle frayed and dirty currency, but medical experts pronounced it a positive menace to health. The mere destruction of worn-out money cost the government millions of dollars each year. The idea of washing bills and returning them to circulation had its origin in the brain of Charles D. Norton, former Assistant Secretary of the Treasury, and now private secretary to the President. The machine now in use for this purpose is the invention of Frank B. Churchill.

Its method of operation is to take the bills, spread them on a screen, and pass them rapidly through a solution of soap and water, which takes off all the grime. Another disc then carries them through a strong antiseptic solution which acts as a germ destroyer, after which a third bath removes all traces of the other two washes and prepares the bills for the "plater," which is similar in character to the roller used in pressing money. This process not only restores the original colors of the inks on the bills, but also imparts to them their original crispness.

Before the general fear of germs in paper currency became so widespread bills usually remained in circulation from four to five years. Now, however, the average life of a bill is less than 14 months. This means that the average life of a bill will be prolonged nearly 50 per cent, since it will be frequently renewed by this process and that the entire currency of the country will be renewed about every two and a half years.

The importance of "dirty money," and its ability to spread disease is also a factor in modern bacteriology, which has lately attracted the attention of scientific men, and various attempts have been made to relieve this situation. Mr. A. Cressy Morrison, of Chicago, has asserted that, as the result of a thorough analysis of 24 of the worst bills, it was shown that germs of grippe, tuberculosis, diphtheria, and other contagious diseases were present. An average of 142,000 bacteria of the various dangerous maladies was found on each bill, which is a matter of grave concern, when it is taken into consideration that this money has passed through the hands of thousands of men, women, and children all over the country. It has now been proved that paper money is a means of carrying disease. Germs of tuberculosis and other contagious disorders may live for long periods of time in bills, and the danger is real enough to enlist the interest of the Federal Government.

Mongoose, Pest of. The mongoose which was introduced into Jamaica 40 years ago to kill rats has, in its turn, become a pest and is accused of causing a loss of millions of dollars worth of property on the islands adjacent to the United States. In consequence, it has been prohibited in the United States and one caught near Atlanta, Ga., during 1910 was believed to be the only one at liberty in America. Port officials have been compelled to keep close watch, as travellers are constantly attempting to

smuggle them into the country. The poisonous snakes which were injuring the sugar crop in Jamaica in 1872 were soon completely done away with after the introduction of the mongoose. But the rats were not killed off and in some cases a combination of rat and mongoose has been bred which is a particularly destructive animal. Soon farm yards were devastated by the mongoose and the land snails were all killed. Then the native birds were killed off and following them the green, the hawkbill, and other marine turtles became extinct when the mongoose had learned how they hid their eggs. This disturbing of the balance between the earth's creatures had the effect of permitting insect life to increase in an alarming degree and Jamaica suffers with a pest of insects. Before the damage it was guilty of accomplishing became apparent the mongoose had been introduced into Porto Rico, Hayti, Vieques, and St. Thomas, in the Atlantic, and the Hawaiian Islands in the Pacific. In all these islands it has been an evil influence. The Biological Survey, fearing the spread of the mongoose in this country, as well as other similar destructive agencies, has asked Congress for an appropriation with which to fight them. It is estimated that mongoose would do \$50,000,000 damage a year in this country.

Monoplanes. See AVIATION.

Monorail (Gyroscope). Both England and Germany demonstrated, during 1910, the practicability of monorail cars as vehicles of transportation. The scientific principle underlying the monorail has long been known, but great difficulty has been experienced in bringing it to a state where it may be of commercial value. However, now that a start has been made in this direction, it appears highly probable that the new vehicle is destined to lead an important advance in railroading. The principle involved in the monorail is that of Isaac Newton's first great fundamental law of motion, namely: A mass in motion will move forever in a straight line with uniform speed unless some external force turns it aside, retards or accelerates its velocity.

If turned out of a straight line the new path is the direction of the impressed force. The secret is the tendency of all bodies to move in the direction in which they are started. The greater the quantity of matter (mass) in a moving body, the greater the force required to draw it out of its pathway. The law of inertia, under which all matter exists, is: A body at rest will remain at rest forever unless some external force causes it to move, and if in motion will move forever unless some external force stops it. All these laws are embodied in the gyroscope. The heavy ring, or disc, of a gyroscope persists in its original plane of motion. The latest and most successful type of car for a monorail carries two gyroscopes. "Persistency" may be obtained in a gyroscope in two ways. The first is by having a heavy ring, or disc, moving at a slow rate of speed; the second, by having a light ring moving at a high rate. On the monorail car the latter has been adopted to save weight.

The Brennan monorail system, which had practical tests in England, proved most successful, engaging in the transportation of freight around the yards under ordinary practical con-

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ditions In the course of the tests as many as 50 passengers were carried at one time around a circular track at a speed of about 20 miles an hour with perfect comfort, while all told some 300 persons had an opportunity of testing the durability of the new vehicle. An interesting feature of the tests was the tilting of the car platform to facilitate the loading and unloading of freight. With the car at rest on a curve packing blocks were laid on the ground, reaching to within about a foot of the chock on one side of the car. The driver then inclined the car so that the chock rested on the packing blocks, planks were laid resting one end on the ground and the other against the car platform so that the inclined plane of the platform extended down to ground-level. The packing cases were then easily shoved off without the assistance of any tackle whatever. On unloading being completed, the driver caused the car to recover level immediately, all the operations of tilting and righting being performed solely with the assistance of the gyro-scope gear. During the actual running the car inclined inward automatically so as to counteract the effect of centrifugal force, while the freight which was carried was simply laid on the flat platform of the car without being secured in any way, and there was no inclination to disturb the position of any of it while on the curve. This clearly showed the perfect balance of the gyroscopes. The simplicity of the track on which this monorail car is run renders it particularly adaptable for military purposes. The short cross-sleepers are simply laid on the ground without ballast, and, where the track runs in a straight line, longitudinal sleepers may even be used.

About the time at which the Brennan car appeared in England, Germany came out with a similar monorail, the invention of Richard Scherl. This car was brought to America and gave exhibitions in Brooklyn, N. Y. In these trials the fly-wheels ran at a speed of 7,000 to 8,000 revolutions per minute and upward, being driven by electric motors. The latter are the only drive seriously considered for railway-car purposes. How high this rotary speed may go, however, is still a question of surmise. The weight of the gyrostat mechanism in this car required some 6 or 7 per cent of the total weight of the vehicle. With such weight it has been shown that an entirely admissible and very effective apparatus may be attained, though in selecting a speed regard must be paid to the construction of the drive and to the strength of the material.

The revolving masses are enclosed in tight envelopes from which the air is excluded, so far as possible, thus minimizing friction and using the least possible power from the motor. As a result of the small friction it takes the gyrostat some time to come to rest—usually about four hours. This removes the ground for apprehension that some disaster may befall if the current be cut off from the gyrostat. In such a case the passengers would have more than an hour in which to get out or prop up the car by means provided for that purpose. Since, however, interruptions of currents on the few occasions when they have occurred, have lasted but a few minutes they are practically negligible so far as the operating safety of the system is

concerned. All these things the Scherl car has proved.

If the gyrostat is to run *in vacuo* it will be unavoidable to place the motor in the vacuum with it. Thus the difficulty of cooling will still necessitate a good deal of study on the part of the inventors. The gyrostat motors must be in every case so calculated that they will be able to impart a sufficiently great acceleration; since, if the revolving masses require 4 hours to come to the stop, they will also require a certain time to acquire their speed. A single disadvantage still present, although one which may be easily removed, is the loud noise produced by the fly-wheel, which is sometimes increased by resonance. It is thought by inventors that if the bearing be modified and the inside mechanism altered somewhat this disagreeable feature will disappear.

The danger of derailment in a monorail car is not greater than in the ordinary kind, and may be even less. It is not the least advantage that, should the car leave the track, on a level road at least, the gyrostat would, as a rule, keep it upright. Another feature which is commending it to the serious attention of railroad men is that the tracks may be laid with much more speed, much less cost, and much less care than is at present necessary.

Montana. The largest of the Mountain Division States of the United States having a population of 376,053, according to the 1910 census, or a gain of 545 per cent over 1900. The population per square mile is 26. The area is 146,572 square miles. Helena is the capital; population 10,770.

Agriculture.—According to the *Crop Reporter* of the Department of Agriculture, of the acreage, production, and value of important farm crops, Montana for 1910 has the following: corn, 184,000 bushels, acreage, 8,000, value, \$175,000; winter wheat, 6,270,000 bushels, acreage, 285,000, value, \$5,392,000; spring wheat, 4,290,000 bushels, acreage, 195,000, value, \$3,689,000; oats, 13,300,000 bushels, acreage, 350,000, value, \$6,118,000; barley, 1,456,000 bushels, acreage, 52,000, value, \$903,000; rye, 80,000 bushels, acreage, 4,000, value, \$54,000; flaxseed 420,000 bushels, acreage, 60,000, value, \$1,003,000; potatoes, 83,000,000 bushels, acreage, 25,000, value, \$2,550,000. The farm animals on 1 Jan. 1910 (the latest figures on this subject) were 319,000 horses, value, \$25,520,000; 5,000 mules, value, \$510,000; 80,000 milch cows, value, \$3,720,000; 842,000 other cattle, value, \$23,071,000; sheep, 5,747,000, value, \$24,137,000; number of sheep of shearing age on 1 April 1909, 5,000,000, the average weight of fleece 7 pounds, the wool, washed and unwashed, 35,000,000 pounds, wool scoured 13,300,000 pounds and per cent of shrinking 63. Much of the agricultural development is due to the experiments carried on by dry farming or what is better known as "scientific farming."

Mining and Manufacturing.—It is estimated that the copper production of Montana will probably not exceed 285,000,000 pounds for 1910 as compared with 314,858,291 pounds for 1909. Montana will therefore rank second to Arizona as a copper producing State. During 1910, the most important event in the Butte district was consolidation of the Amalgamated Companies as the Anaconda Copper Mining Company and its purchase of the copper interests of W. A.

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Clark, including the Butte Reduction Works, which were closed. This has brought to an end the controversies over the ownership of the ore bodies. The consolidation has also reduced the cost of production. According to the Bulletin of the U. S. Geological Survey for December 1910, the production of primary lead for 1909 smelted was 2,752,000 pounds. This production surpassed all previous State records. The highest prior output was that of 2,016,857 pounds made in 1907. The development of the Blue Mountain field near Billings in Yellowstone County was a factor of this increase in production. For 1909, there were 81 mining machines used in the coal mines and the machine-mined product amounted to 740,686 short tons or 29 per cent of the total output of the State. According to the last table of the Geological Survey on the sources of gold and silver product, that of Montana was as follows: Gold—Deep Mines, 121,307 fine ounces; placer, 26,606; Silver. Dry Silicons ores, 1,719,486 fine ounces; 361,762 lead ores and 8,274,951 fine ores. The approximate distribution by producing states and territories of the product of gold and silver for 1909 was gold, 174,123 fine ounces, value, \$3,599,400; silver, 12,000,000 fine ounces, value, \$6,241,900. The capital employed in manufacturing was \$52,589,810 and the value of the product, \$66,415,452. There were 8,957 wage earners and the wages paid came to \$8,652,217. The smelting and refining of copper is the most important industry. There is over \$4,000,000 invested in lumber and timber.

Government—The Governor is Edwin L. Norris, Democrat, whose official term of four years expires Jan 1913. The salary is \$5,000 a year. The Lieutenant-Governor is William R. Allen, Rep.; Secretary of State, A. N. Yoder, Rep.; Treasurer, Elmer S. Esselstyn, Rep.; Attorney-General, A. J. Galen, Rep. The Legislature stands as follows; Senate—Republicans, 16, Democrats, 12, House—Republicans, 32; Democrats, 42. The State is represented in Congress as follows: In the Senate, Joseph M. Dixon, Rep, his colleague not chosen. House—Charles N. Pray, Republican.

Finance—The last available figures at this writing show that the State debt less sinking fund assets is \$1,203,769, the debts of the cities, counties and minor civil divisions, \$7,716,920 and the per capita debt, \$33.87. Montana has \$3,000,000 invested in interest bearing securities. The valuation of the real property is \$218,240,500, and of the personal \$91,433,199. The tax rate is \$2.50 per 1,000. Montana has 40 National banks with 6,535 depositors and deposits \$3,476,795.38. State banks, 40; depositors, 3,934, and deposits, \$1,522,131.05; Private banks, 8, depositors, 525, deposits, \$177,223.59; Loan and Trust companies, 5, depositors, 6,015, deposits, \$1,228,289. The Savings bank depositors number 5,990, the deposits \$2,927,872.06.

Religion and Education—The Roman Catholics are the most in number. There are 38,155 male and 33,898 female. The Methodist bodies number 2,368 male and 4,409 female, Presbyterians, 1,462 male, 2,619 female, and the Baptists, 663 male and 1,366 female; Disciples or Christians, 632 male and 1,226 female. There are 51,346 pupils enrolled in the Common Schools and the average daily attendance is 35,422. The teachers number 1,907. Montana has three universities, and colleges and technical schools, whose instructors number 61 and students, male,

706. Under the State law, children living farther than 2½ miles from a school need not attend. The disbursements for education according to the last statistics were \$2,396,122.

Charity—There are 15 private or ecclesiastical and 1 public orphan asylum, 3 private and 1 State home for adults and a State school for the deaf and blind. Under the poor law, a person applying for relief must show a two months' residence in the county and by the same statute, parents, grandparents and descendants of a pauper are liable for his support. The last available figures showed 429 inmates of the almshouses.

Legislation—The Legislature meets biennially, and its session is limited to 60 days. The last regular session was in 1909. There was a special session in 1910. At the 1909 session additional powers were conferred on the State Railroad Commission for the enforcement of rules and regulations for the use of safety appliances by common carriers, to enforce the construction of commercial spurs and the District Court was empowered to enforce by proper decree the injunction rulings and orders of the Commission. The railroad company is given the right to appeal to the State Supreme Court from the judgment of the District Court and gives precedence to railroad business over all other Court proceedings, except Criminal and original proceedings in the Supreme Court. Laws were also passed providing for non-partisan judicial nominations, making holidays of Lincoln's and Columbus' birthdays, prohibiting rebates and discrimination by life insurance companies, measures against tuberculosis and other contagious diseases, making coal mine employers liable to employees in cases of total disability, regardless of negligence and prohibiting trusts and monopolies.

History—The clearing of the copper situation has already been told. During the year, land on the Flathead and Cœur d'Alene reservations was opened. There were serious forest fires on the Flathead Indian Reservation during August 1910. A battalion of the 14th Infantry was sent to Missoula, Mon., to help in checking them.

Montenegro. Since 1910 a kingdom; situated in southeastern Europe. The country extends westward almost to the Adriatic Sea, eastward to Novi Bazar, southward to North Albania, and northward to Herzegovina.

Area and Population.—The maximum length of the country is about 100 miles, and the width 80. The area is estimated at 3,485 square miles. Emigration has reduced the population of Montenegro to about 225,000. The capital town is Cetinje, which has 5,000 inhabitants. Other important cities are: Podgoritz, 10,000 population; Dulcigne, 5,000; Niksic, 5,000; and Antivari, 2,500. The people of the country are of Slavic origin.

Government.—The reigning Prince of Montenegro, Nicholas I, was born in 1841. A former ruler, in 1697, freed the country from Turkish oppression, and establishing himself as the spiritual and political leader of the people, formed a coalition with Russia. The uncle of Nicholas I, however, abandoned spiritual titles and functions, and succeeded in establishing himself in the eyes of Russia as a more independent sovereign than his predecessors. The

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absolute independence of the principality was attained under the present ruler in 1878, at the signing of the Treaty of Berlin. In 1900 the prince assumed the title of "Royal Highness." He granted a constitution in 1905, which makes the kingdom a limited monarchy with popular representation. The National Assembly must be convoked annually, it is composed of 74 members, — of whom 62 are elected by the people to a four-year term of office, as follows: one from each of 56 districts, and one each from six provincial towns. Twelve ex-officio members, viz: six high officials of the State, three nominated generals, and three ecclesiastical functionaries, sit in the assembly. There is, of course, a Prime Minister in the government, assisted in the administration by department ministers.

Finance. — The estimated revenue for 1909 was about \$500,000, and was balanced by the expenditure; the 1910 revenue and expenditure, \$695,500, approximately. The public debt in 1910 was about \$1,250,000. Land taxes, customs, and monopolies provide most of the revenue. The expenditures are chiefly for justice, the interior, finance, war, education and religion, and the civil list. An annual subsidy of \$200,000 is received from Russia, toward the defrayment of military, education, and hospital expenditures. At the capital the Bank of Montenegro conducts this business, and there are banks at Podgoritz and Niksic. Nickel and bronze coins with the country's stamp are in circulation; but Austrian money is principally used.

Education, Religion, and Justice. — At the capital there are a theological seminary, a boys' college, and a high school for girls; the latter has about 100 pupils, and is maintained by the Russian throne. Education in the country is gratuitous and obligatory, and is supported by government appropriations. Almost 200,000 of the country's inhabitants are of Orthodox Greek faith; 13,000 Mohammedan; and 14,000 Roman Catholic. His Royal Highness appoints the bishops of the Orthodox Church. The head of every family is taxed for the purpose of sustaining the country clergy. There are five district courts in Montenegro, and courts of first instance in all of the 56 districts. Appeal courts exist in five principal towns, and at the capital there is a supreme court. Crime is uncommon in the principality. Some assistance is given the poor.

Industries and Trade. — There are no large private holdings of land in Montenegro, which belongs, however, to those who cultivate it. The chief products of agriculture are maize, tobacco, oats, potatoes, barley, and buckwheat. Vines and olives are cultivated in some parts. The forests contain such valuable woods as beech and oak, which cannot be worked owing to the lack of facilities for transportation. The stock-raising industry is valuable; there are about 500,000 sheep and goats in the country, 60,000 head of cattle, 8,000 pigs, and 3,000 horses. The leading imports into the country are salt, kerosene, maize, cottons, hardware, sugar, coffee, and rice; and the exports abroad, smacch, flea-powder, smoked sardines, mutton, cattle, sheep, goats, cheese, wool, hides and skins, furs, honey, olive-oil, wine, and tobacco. The total annual imports amount to about \$200,000, and the exports to \$280,000. The foreign countries monopolizing Montenegrin im-

port trade in 1907 were as follows: Austria-Hungary, Italy, Turkey, and Great Britain. There are some good roads in the country, connecting the principal cities. Three steamers ply the inland waters. Postoffices number 21, and there are more than 500 miles of telegraph line.

History, 1910. — In Sept. 1910, the principality of Montenegro on the Adriatic, one of the most picturesque and romantic countries remaining in Europe, celebrated the 50th year of its rule under Prince Nicholas by becoming a kingdom. The special occasion which gave cause for this increase in importance was the freeing of the sea coast from Austrian rule. A small, peaceful country, happy in its ability to maintain its independence against the Turks for many centuries, all Europe joined in the hearty congratulations which came to Montenegro on its added glory. This attitude was due to the fact that King Nicholas is himself a man well known and much liked in all the courts of Europe, and when at home dispenses justice from the bench before his door. He has but 10,000 subjects, but they are hardy mountaineers and capable fighting men. Nicholas is himself half hero, half diplomat, and hopes for the day when all Serbs will be united again. With Bosnia and Herzegovina in the grasp of Austria, and Novi-Bazar in the hands of the Turks, separating Montenegro and Serbia, that does not appear to be an immediate possibility, but there is a growing sentiment towards a coalition of Serb interests which may bring about a considerable kingdom under the dominion of Montenegro.

Montenegro has risen to its present importance on account of Nicholas' large family of daughters. Several of them have married very well and have been able to influence other governments in favor of their own country. They are unusually attractive women and have a gift of democratic charm, inherited from their mountain forefathers which has made them particularly well liked. The oldest daughter, Zorka, made a rather poor match, marrying Prince Peter Karageorgevitch, dying before he became King of Serbia. The second and third daughters married Russian Grand Dukes and their influence over the Czar was sufficient to secure from him a gift of 30,000 quick-firing guns and 20,000,000 cartridges. The fourth is Queen of Italy, and has been able to influence the King to take a hand in Balkan affairs. The fifth married a Prince of Battenberg, and the sixth, Princess Xenia, was named as the probable bride of the Italian Duke d'Abruzzi, brother of the King and suitor for the hand of Miss Katherine Elkins. Another daughter, Vera, also remains unmarried.

The Crown Prince Danilo was able to induce his father to grant a constitution, but when the first parliament assembled, the eagerness of the delegates to interfere with the king's rule set him against them and he dismissed the body, telling his subjects that as long as he ruled, his word should be law. Fortunately, he is a benevolent monarch, taking little from his subjects. His second son, Prince Merko, has married a princess of the Obrenovitch line and has pretensions to the throne of Serbia, which may assist at some time in a coalition of the Servian people.

Montgomery, Alexander Brooks, American politician: b. Harden Co., Ky., 11 Dec.

MONTSERRAT — MOONSHINERS

1837; d. Elizabethtown, Ky., 27 Dec. 1910. He graduated at Georgetown College, Ky., 1859, LL.B., Louisville Law School, 1861, farmer in Elizabethtown, Ky., 1861-70, county judge Harden County, Ky., 1870-74, State senator, 1877-81, Democratic representative from the 4th Kentucky district in the 50th and 53d Congresses, 1887-95, and member of the Committee on Ways and Means, and a framer of the Wilson tariff bill. He was a member of the Dawes Indian Commission, 1895-97, and practiced law in Elizabethtown, Ky., 1897-1910.

Montserrat. A mountainous island in the British West Indies, about 11 miles long and 7 miles wide. The area is about 32 square miles. The island was discovered the year after America was, and by Christopher Columbus. The population in 1909 was about 14,100. The principal town is Plymouth, which has almost 1,500 inhabitants. The government is that of the Leeward Islands, and is directly administered by an Executive and a Legislative Council, both nominated. The revenue for 1909-10 was estimated at \$53,000, and the expenditure of the government at about \$39,000. The public debt was \$55,000. The savings bank deposits of the country in 1908 aggregated about \$20,800, to the credit of 171 people. The leading products of the colony are sugar, coffee, cocoa, papain, arrowroot, and lime juice. The preserving of fruits for shipment has become considerable of an industry. Sea Island cotton to the value of about \$33,000 was exported in 1909-10; total exports in that year amounted to \$157,500, and the imports to \$1,000 less. Montserrat is noted for its beautiful and healthy climate.

Moody, William Henry, American jurist: b. Newbury, Mass., 23 Dec. 1853; graduated from Phillip's Academy, Andover, in 1872, and from Harvard A.B. 1876, and Harvard, Tufts and Amherst, in 1908, conferred on him the honorary degree of Doctor of Laws. He studied law in Boston, was admitted to the bar in 1878, and established himself in practice at Haverhill, Mass. He was city solicitor, 1888-90, district-attorney for the eastern district of Massachusetts, 1890-95; chairman of the Republican State Convention of 1898, and a Republican representative from the 6th district of Massachusetts in the 54th Congress in 1895, to fill a vacancy caused by the death of Representative William Cogswell, 22 May 1895. He was reelected to the 55th, 56th, and 57th Congresses, serving 1897-1902. He resigned his seat in Congress, 1 May 1902, to accept the office of Secretary of the Navy in President Roosevelt's cabinet, and remained in that office until 1 July 1904, when he was transferred to the department of justice as attorney-general of the United States. On 17 Dec. 1906, he was appointed an associate justice of the United States Supreme Court, and he was, in 1910, compelled, by continuous illness, to lay aside public work. On 23 Nov. 1910, a written expression of regret was tendered him by his former associates on the bench, Justices Harlan, White, McKenna, Holmes, and Day, and by the newly appointed justices Lurton and Hughes, and this correspondence, which included the reply of Mr Justice Moody, was ordered spread on the records of the United States Supreme Court, 8 Dec. 1910. With the

exception of Mr Justice Shiras, he is the only Supreme Court Justice holding the retired position.

Moody, William Vaughan, American author: b. Spencer, Ind., 8 July 1869; d. Chicago, 17 Oct. 1910. He was graduated from Harvard in 1893, and received the degree of Litt.D. from Yale, 1908. For two years, 1894-95, he was assistant in English at Harvard and Radcliffe, and instructor of English and rhetoric, 1895-1901; from 1901-07 he was assistant professor of English at the University of Chicago. As an author, especially as poet and dramatist, his works have gained much favorable comment; especially 'The Masque of Judgment' (1900); 'Poems' (1901); 'The Fire-Bringer' (1904); 'The Great Divide' (1907); and 'The Faith Healer' (1909).

Moonshiners. In spite of persistent efforts on the part of the Internal Revenue officers moonshine whiskey is manufactured to a greater extent in the mountains south of Mason and Dixons's line than at any time in the history of the country. Aided by the roughness of the country and a region characterized by many caverns, the inhabitants have been able to carry on the illicit traffic in whiskey with only occasional interference. Statistics which have been recently gathered show that over 1,000,000 gallons of whiskey were manufactured and sold without paying the government license during 1910.

In the past eight years 10,000,000 gallons of this contraband liquor have been produced in the mountain stills, according to government estimates. During that time the revenue officers have made 20,000 seizures, arrested 7,000 distillers, and awarded \$100,000 for information. The small amount of rewards in comparison with extent of the traffic indicates the general sentiment of the country affected as regards the tax. Further confirmation of the same attitude shows in the fact that 97 revenue officers have been killed during this time, and 83 received wounds from which they later died. Those seriously injured and maimed but not killed by the bullets of moonshiners numbers 243.

The price of moonshine whiskey is \$1.10 a gallon, the exact amount of the government tax. It is mostly consumed in the mountains and the country immediately adjacent, and through all that portion of the United States lying about the Appalachian Mountains from West Virginia and Kentucky to Georgia, the sale of taxed whiskey is very small.

The mountaineers, who have lived in this country continuously for 150 years or more began making whiskey before the American Revolution and for many years were undisturbed in the traffic, since they sold it then as now largely among themselves. They remained so long undisturbed that they have long ago come to consider it their right and the interference of the revenue officers has never appeared to them in any other light than as the hostile action of an unfriendly power. Born and raised under the influence of an intense race pride, and guided all their lives by a strong individualistic sentiment, they are unable to see that their conduct is in any way wrong. Blood feuds between families have at times resulted in more bitter vendettas than have

MOONSHINERS — MORGANITE

ever been known elsewhere. To people capable of such intensity of feeling it is easily understood how they would naturally come to look upon the revenue officers as their bitter personal enemies and wage a war against them that has lasted since long before the Civil War, and is now going on with unabated fury.

There is, however, a very hopeful sign. Attempts are being made to secure for the poor boys of these mountain sections a wider education, and whenever they have been given a glimpse of the outside world and come to appreciate the necessity of government supervision they have yielded to it and done all in their power to spread the new ideas. But their work is difficult as the feeling in the mountains has become deep-rooted and is hard to dispel. The daily activity of the revenue officers, their spying methods, made necessary if any information is to be gathered, and the animosity which has come to actuate them in many cases through prolonged disappointment, has too often made their administration of the law appear to the mountaineers as a personal vengeance. This might be expected. Where the fighting is so hard on both sides, enmity is certain to arise, no matter how kindly the feeling between the men might otherwise be. To be a revenue officer requires a certain downright courage and recklessness which usually forms part of a temperament which will brook no opposition.

Unfortunately, the opportunities afforded the young mountaineers for education are limited and in order to secure funds with which to obtain it, the chief opportunity exists in the making of contraband liquor. To remedy the evil, it is now agreed, depends not upon the revenue officers, whose efforts have been without final success, but by education and an effort to better conditions generally.

As it is, secret stills are in operation in many places throughout this mountain district. The revenue districts number 16, and each officer cares for a wide stretch of territory. Seizures are ordinarily made when the moonshiner attempts to dispose of his product, and, believing the still to be with a certain restricted section, the officers ride in fully armed as into a hostile country. Success on their part, however, is only attained after encountering many difficulties. On account of the formation of the country the stills are all placed deep in caverns which have only been fully explored by the moonshiners themselves and the still is located in a spot so inaccessible that it is practically impossible to find it even if the outer entrance to the cave is discovered. This is usually small and screened with natural growths which are left undisturbed so that a stranger could ride within a yard of the entrance without discovering its existence. But even when entrance has been gained, further progress can easily be blocked by one man, and even with him out of the way, the passages are so involved that the stranger is likely to be lost.

The smoke from the fire must escape in some manner, of course, and in the daytime this can be seen for miles. On that account the stills are all worked at night.

The most successful raid ever made by the revenue officers was in the valley of the Big Sandy. Altogether 106 moonshiners

were seized in a period of six months, and during that time 37 stills were smashed. The stills represent a considerable cost and a raid of that kind has the effect of preventing illicit distilling until new ones can be purchased, but the enmity of the mountaineers is only aroused to a higher pitch by it and they become more cautious. The one effectual method of preventing the breach of the law is to lighten the lives and raise the standards of living. The mountaineers are all intelligent, but their intelligence has all been used in one direction. The children yield to educational influences. Large sections of the mountain country are practically never entered by strangers and all the mountaineers know of the outside world is the destructive appearance of the revenue officers. The final cure of moonshining does not lie through them, but a wider effort towards opening the mountain fastnesses and connecting them again with the world.

Moravian Church. An evangelical Christian denomination established by the followers of John Huss, in Moravia and Bohemia, also called the United Brethren and Moravians. The church established its first beginnings in 1735, in Georgia, and five years later, by the moving of the colony of Moravians to Pennsylvania, was established there. The towns of Bethlehem and Nazareth were settled by this people. The entire membership of the church, in 1909, was 17,951, including 13,932 in the American Moravian Church North, and 4,019 in the American Moravian Church South. The churches number 122, and ministers, 141. The Sunday-schools have 14,379 scholars. The Northern churches have upwards of 40 missionary societies, with nearly 4,000 members. Foreign mission work is supported in Asia, Australia, West Indies, Nicaragua, Alaska, Bohemia, South America, and Labrador. The Moravian College and Theological Seminary at Bethlehem, Pa., Linden Hall Seminary for Girls, Salem, N. C., Nazareth Hall for Boys, Nazareth, Pa., are among the educational institutions controlled by the church. *The Moravian* is the organ of the English-speaking communicants, and *Der Brueder Botschafter* of the German. The General Synod of the Moravian Church for the world was convened at Herrnhut, Saxony, in Germany, in the summer of 1909. The next Synod of the American Moravian Church, North, will be held in 1913.

Morganite. The New York Academy of Sciences conferred a graceful honor on J. Pierpont Morgan early in Dec. 1910, when it named after him a newly discovered gem, which is a species of beryl. Morganite is the official name of the new stone. This gem, which was first discovered in its perfection during 1910, differs from other beryls, in that it glows an intense cherry red when exposed to the X-ray. It is found in magnificent gems weighing from 1 carat to 100 carats each, and is of a beautiful brilliant rose color, with remarkable freedom from flaws. It is the purest pink gem that has been found in large gems, rivaling pink tourmaline and pink topaz. It is found principally in the mountainous regions of Mount Bity, an island off the coast of Madagascar. So far as is known the best and only complete collection of morganite consists of about 50 stones,

now in America. Morganite is also found associated with kunzite at Pala, San Diego County, Cal., but only in large pale crystals, or sometimes more salmon colored than the best examples. Morganite is undoubtedly one of the most important gem minerals of this remarkable mineral find from Madagascar. It is not only the finest example from this locality, but furthermore is unique as a pink gem of any kind from any locality, being obtained in larger and finer gems of rose color than any other pink gem before known to the world. The new discovery has been named after Mr. Morgan, in recognition of the encouragement he has always extended to the arts and sciences, and for his presentation to the American Museum of Natural History and the Museum of Natural History in Paris, of collections of precious stones and minerals in 1889, 1900, and 1902.

Morley, John, English statesman and author b Blackburn, Lancashire, 24 Dec. 1838. He was educated at Cheltenham and Lincoln College, Oxford (1859), and was called to the bar (Lincoln's Inn) in 1873. He was editor of the *Fortnightly Review*, from 1867 to 1882; of the *Pall Mall Gazette*, from 1880 to 1883, and of *Macmillan's Magazine*, from 1883 to 1885. From 1883 to 1895 he was a member of Parliament (Liberal) for Newcastle-on-Tyne; and in 1886 was Chief Secretary for Ireland. Up to that time his most notable books were: 'Edmond Burke' (1867); 'Voltaire' (1872); 'Rousseau' (1876); 'Diderot and the Encyclopædists' (1878); 'Richard Cobden' (1881); 'The Struggle for National Education' (2d ed. 1873); 'On Compromise' (1874), and 'Ralph Waldo Emerson' (1884). From 1896 to 1908, he was member of Parliament from Montrose Burghs. He had grown up in the school of advanced Liberalism, and had developed principles which were well adapted to the political conditions and the social changes of the United Kingdom. They were in substance and spirit democratic and in close harmony with the movement of British opinion and sentiment in the last half century. In 1905, he was called to take charge of the Indian Empire, as Secretary of State. Democracy, as known in England, did not exist in India. It became his duty to control the expenditure of revenues in India, and deal with all questions of peace and war. Thus he became the ruler of about 300,000,000 people, with a government administered by a few English civilians and a small contingent of English soldiers. His first duty was to prevent and subdue disorder of every sort, and he was brought face to face with the problem of how far the usual British practice regarding liberty of the person, speech, and press, could safely be applied in India. Lord Morley at once began to enforce the regulation of the native press, the general checking agitation tending to lawlessness, the restriction of popular meetings, and the arrest, imprisonment, or banishment of dangerous agitators. Naturally, he was violently criticised, both by those who accused him of going too far and those who charged him with not going far enough. In the meanwhile, he made a substantial extension of representation to the natives in the administrative and legislative departments of the government, in the hope of enlisting adequate support among the more intellectual classes of

India. His exposition and defence of his work before Parliament make his later speeches a body of political literature which for dignity, lofty spirit, candor, and courage is notable. Owing to his advanced years (72), he felt compelled to relinquish the burden of this office, and, at the end of 1910, he resigned.

Morocco. A country in the north of Africa, an empire ruled by a Sultan.

Area and Population.—The area is estimated at from 219,000 square miles to 314,000 square miles, and the population at from 4,500,000 to 8,000,000. The empire comprises the Kingdom of Fez and Morocco, and the territories of Sus, Dra, Wadi Tafilet, Tuat, and others. Morocco comprises a great part of the Saharan Desert. The lands of many of the partially dependent tribes are hard to define, and the populations are precarious. Hence it is impossible to obtain accurate figures or to fix area. Among the population are a great many Jews, probably 300,000, and numbers of negroes. There are about 10,000 Christians in the country. The principal city is Fez, with 140,000 inhabitants. Tangier has 35,000 inhabitants.

Government.—Mulai-Abd-el-Hafid was recognized as the ruler of Morocco, in 1909, in pursuance of a pledge to the powers of his willingness to abide by the terms of the Act of Algeciras. He is the head of ecclesiastical and political affairs, in the most absolute sense. The Sultan has six advisors, who are only at liberty to exercise the prerogatives of their office at their sovereign's command. These ministers "control" the administration of Foreign Affairs, Home Affairs, War, etc. The "office" of Sultan is elective; but there the right of popular franchise ends. Several of the countries of Europe have a hand in the affairs of Morocco. There was, prior to 1906, an understanding that France should assist in the regulation of the country's "interests," but not so as to gain any exclusive advantage for itself. The arrangement proved so unsatisfactory as to cause an assemblage of nations at Algeciras (United States being represented) in 1906, when a General Act was passed. By the terms of the Act, there was established a Moorish police force under the joint command of French and Spanish officers. A banking institution was also established, to be the Government financial agent, the bank to be supervised by representatives from the four National banks of England, Germany, France, and Spain. Under this act of Algeciras a declaration of the powers was concurred in, to the effect that no selfish advantage should be taken by any power; but that the interests of the despot-dominated State should be promulgated.

Finance.—The receipts of the government from customs are estimated at \$2,200,000. The total debt of the country aggregates about \$40,000,000. Spanish money for Morocco is coined in France, Germany, and England. French and Moorish money are also in circulation, at various values.

Industry and Trade.—Some of the most important products of the country are: wheat, barley, maize, beans, peas, oil, esparto, and hemp; fruits also, comprising figs, almonds, pomegranates, lemons, olives, oranges, and dates. Agriculture is backward. The mineral

MOROCCO — MOSESITE

resources consist chiefly of antimony, iron, coal, copper, lead, tin, and some gold and silver. The sheep-raising industry is profitable. The imports in 1908 were principally cottons (figures approximate) to the value of \$5,240,000, sugar, \$3,505,000; tea, \$1,105,000; iron and iron-ware, \$600,000, candies, \$370,000, and flour, \$310,000. The exports were chiefly barley, \$3,157,000; oxen, \$1,425,000; eggs, \$1,112,000; hides and skins, \$990,000, almonds, \$505,000, olive oil, \$502,500; slippers, \$232,500; and wool, \$207,500. Total annual imports amount to about \$14,872,700, and the total exports to \$12,112,750. Great Britain controls a majority of the trade, imports from the Empire amounting to about \$5,983,250, and exports thereto to \$2,372,350; the total yearly trade with France is valued at about \$7,970,750, with the United States, approximately, \$536,300.

Shipping, Postal, and other Communications.—There are some very important commercial ports in Morocco, among which are Tangier, Tetuan, Larache, Rabat, Casablanca, Mazagan, Saffi, and Mogador. The aggregate trade entering and leaving these ports annually is valued at about \$26,985,500. Shipping entering, about 1,000 British vessels; 650 French; 325 German; 775 Spanish; and 130 Italian. The regulation of the postoffice in the Empire-Kingdom has been undertaken by the four countries, Great Britain, France, Germany, and Spain. Courier service in the country is quite efficient, establishing daily communication between the principal cities. There are four wireless telegraphic stations belonging to the government, at as many towns. The cables of three companies put Tangier in communication with Cadiz and other foreign cities. Among the modern institutions of the country, the newspapers are important factors in the "historical present" of Morocco. There are English, French, Spanish, and German periodicals in circulation.

History, 1910.—When Abdul Aziz signed the Algeiras convention he brought about his own downfall and the rise of Mulai Hafid. Morocco was not prepared for "Europeanization," and expressed its will in that way. In point of fact, however, if the European powers in the eagerness to take advantage of the new situation had not overstepped themselves, Morocco would have been able to develop normally and the integrity of the Moorish race been maintained. The change of interior condition in Morocco had the effect, though, not of retarding the European powers, but of giving them opportunity to advance their interests regardless of the Moors. Mulai Hafid was in the end compelled to agree to all the advances made by the Europeans without any of the safeguards provided for in the Algeiras convention.

Mulai Hafid, in assuming command was obliged to revive all the worst abuses of the empire in order to secure the necessary support to reestablish government authority on small resources and a small show of authority. The government he substituted for that of Abdul Aziz was thoroughly reactionary, and by 1910, two years after he had begun ruling, Morocco was brought to a realization of its position and was able to see that by dethroning Abdul Aziz it had brought down upon itself a much worse state of affairs than existed under his régime.

Morocco has, in effect, been given up to exploitation by European powers, and France, on account of its hold in Tunis and Algiers, has been able to take the greatest advantage of the situation. The most significant event of the year 1910 was the Riffian campaign, carried on by the Spanish Government, but while Spain secured great advantages by this movement, France prevented it from profiting by it commercially.

Under the terms of the treaty of 1860, Morocco ceded to Spain a territory about the town of Melilla of "twice the radius of a 20-pound shot," but this radius proved meanwhile insufficient and the Riffian sharpshooters were able to sit on their hills and pick off Spanish officers within the walls of the town. To secure adequate protection and extend its hold as far as possible, Spain engaged Morocco in war in 1910, although the cause was very unpopular in Spain and seemed at one time to threaten the throne. The outcome of it, however, was favorable. Besides receiving war indemnity of \$13,000,000, which more than covered the expense of the campaign, Spain extended its radius of protection to 16 miles, which gave possession of the railroad and the whole of the peninsula of Tres Forcas. The 16 miles also included the shores of the salt lake south of the town and presented such an opportunity as the French had and made use of at Bizerta, Tunis. The hills from which the sharpshooters were able to trouble the Spanish, also fell to the Spanish, who had taken them in battle during the campaign.

To the south of Melilla is a broad valley cutting off the rugged peninsula from the mainland. Having protection from the sea now on three sides, a narrow strip of fortifications will make the town of Melilla practically safe from the tribesmen of Morocco. To prevent Spain profiting in an economic way, however, France advanced upon the Muluya from Algeria and occupied the country to the south, cutting off the route in Melilla. The roads from the south, from the Sahara, and other points, are all in French hands. The important points have all been fortified, and from Lalla Marnia, at the end of the Algerian railroad, a military road has been built to meet the caravan trails. This means easier and cheaper transportation to the Mediterranean via French territory, free from danger of attack by native tribes. In consequence Oran has become the port of the country formerly tributary to Melilla.

Mosely, Alfred, English educator: b 18 Oct. 1855. He was educated privately and at Bristol, Eng., Grammar School. He is widely known in England and America for his industrial and educational commissions to America, and arranging reception of United States and Canadian school teachers on a return visit to England. He is the author of various valuable reports and pamphlets on industrial and educational matters and on economics.

Mosesite. A mineral discovery made by F. A. Canfield, W. F. Hillebrand, and W. B. Schaller while prospecting in the Terlingua district of Texas during the year 1910, has been named Mosesite in honor of Prof. Alfred J. Moses, professor of mineralogy, at Columbia University, New York. Dr. Moses was the first man to definitely describe the mercury minerals

MOTION PHOTOGRAPHY—MOTION STUDY

of that district. Mosesite occurs in the form of small yellow crystals over crystals of calcite. It is composed of a mercury-ammonium compound containing chlorine and the sulphurate group with a small percentage of water. The crystals have peculiar optical properties, which promise to be of distinct value to science.

Motion Photography. An apparatus for taking moving objects going at a higher speed than is possible to photograph with the usual devices has recently been invented. This is used to display such rapid motion as that of flying insect's wings. To study such quick movements the cinematographic apparatus commonly utilized is quite inadequate. These instruments are unable to record, in this short time, a number of images sufficiently great to enable the observed movement to be reconstructed, because in the ordinary cinematograph in order to take each of the images, the strip of film stops and does not go on moving until the lens has been hidden by the shutter.

But these successive stoppings and startings cannot be multiplied beyond a certain limit, which is soon reached. In the common system, the necessity of interrupting the course of the film arises from the fact that despite their apparent instantaneousness, the exposures are of very appreciable duration. If the film should move without stopping, the images would not be clear. But if the exposure is made short enough, the displacement of the film during the exposure will be practically negligible.

How in so short a time to obtain a sufficient illumination of the object to make the image brilliant to impress the sensitive emulsion is the chief difficulty. The problem is easily solved, thanks to the electric spark, which unites just the two qualities that are most essential, namely, instantaneous and photogenic power.

These qualities have been the object of experiment for years and were at length attained by the device invented by Mr. L. Bull, sub-director of the Marey Institute, which enables the photographer to obtain more than 2,000 stereoscopic images per second, regularly spaced on a film with perfect clearness.

Bull has utilized his device especially to study the flight of rapid-winged insects, so arranging it that they are allowed perfect liberty of movement which is effected in the following manner:

For the success of the trials it is indispensable that the insect's flight should be so directed as to traverse the photographic field. To this end the device is placed near a window, so that the insects, being attracted by the light, with rare exceptions, always fly in the same direction. A difficulty more serious to solve depends on the fact that it is indispensable to release the shutter at the precise moment when the creature traverses the photographic field. One system which succeeds well with ordinary flies, consists in keeping the insect captive by holding one foot in an electric-magnetic clamp intercolated in the circuit that controls the shutter. For hymenoptera and other insects that hesitate before taking flight and that therefore start after the shutter has worked, with the arrangement just described, Mr. Bull has recourse to another method, requiring the insect itself to close the shutter-circuit at the exact moment of its start. For this the insect is introduced into a glass tube, cut at an angle

at one of its ends, which is directed toward the light. This end is partly closed by a little door of very light mica, kept shut by a delicate spring which completes the shutter circuit.

After introducing the insect into the tube through the free end, the operator waits to close the shutter-circuit until the insect raises the mica door and this prevents the passage of the current. When the insect flies away, the mica door falls, continuity is reestablished and the shutter works as desired.

With beetles, which are still more sluggish fliers, Mr. Bull utilizes a similar arrangement in which the mica door is replaced by a trap-door of very thin aluminum, balanced by a counterweight which yields under the insect's weight.

These devices, so varied, so delicate, and so ingenious, reduce the chances of failure to a minimum. Mr. Bull's apparatus will take as many as 2,000 photographs per second.

Motion Study. Frank B. Gilbreth, a New York engineer and contractor, after making a life-long study of the motions necessary to carry out various industrial operations, has succeeded in formulating an interesting system by adherence to which a vast amount of time may be saved. This is effected through a scientific study of motion, and a realization of its economic value in standardizing the trades. A workman who performs some ordinary task, such as laying bricks or driving nails, usually wastes a second or two in every operation. The amount is so slight that it seems unimportant, but in the aggregate it often amounts to nearly one-quarter the time occupied by the entire operation. Eliminating it would enable a workman to do in three hours what he formerly took four to accomplish, and would also save energy to the workman, for Mr. Gilbreth has shown that these useless movements often consume more vitality than if they had been put to some practical use. For instance, laying bricks on a wall from a floor, from the height of the floor level up to three feet eight inches high, can be done with the greatest speed when the bricks are each maintained at a height of one foot three inches, plus two-thirds of the height that the wall is higher than the level of the floor on which the bricklayer stands. The brick should never be higher than three feet eight inches under any circumstances. By maintaining the height of the brick in this relative position to the height of the wall, it will always be in position which permits the bricklayer to accelerate the speed of transportation by using the path of the quickest speed. While bricklayers know nothing of this in theory, once they have been shown, they discover its truth in practice. Greater outputs are noticeable as an immediate result of following this method. In bricklaying, too, certain motions may be advantageously combined with an economy of time. The motion used to spread mortar may be combined with that of buttering the end of the stick laid just before mortar is thrown. Thus the two operations may be reduced to one and a great ultimate saving of time and motion result. It may also have other distinct advantages, such as leaving better keying for plastering direct upon the wall. This system includes all other variables, but it can never be considered standardized until each separate motion is a standard. Mr.

MOTOR BOAT—MOUND BAYOU COLONY

Gilbreth not only has figured out the details in the application of motion to brick-laying, but has also applied his theory to innumerable other industrial pursuits. Another interesting phase of his system is the separation of motions into grades, dividing the grades of work according to the skill required; the direction of a movement—often a very important item in time saving; the reduction of the necessary momentum and inertia, as by minimizing starts and stops; the elimination of unnecessary distances, making motions as short as possible, and the determination of the path of economy and of output. The path most desirable is usually that which permits gravitation to assist in carrying the material to place.

Motor Boat, a term generally applied to boats propelled by electric motors or gasoline engines. The use of electric motor-boats has not become extensive owing to the disadvantages of the storage battery which include its weight, cost of operation, and difficulty of charging, and they are employed almost solely as pleasure craft. On the other hand, the development of the gasoline motor-boat has been rapid and important. It dates practically from the beginning of the present century. The principle of the gasoline engine is by no means new. In fact, as early as 1678, the Abbe d'Hauteville invented an engine employing the expansive force of exploded gunpowder. In 1860 Lemoir showed the first practical working gas engine and the improvement upon his design by Otto in 1876 marks the real beginning of the use of the vapor of the lighter petroleum distilled in the engine. In the last decade of the 19th century, naphtha launches, as they were then called, began to be common, and now these small power boats are most widely employed for pleasure, commercial, and fishing purposes. Many pleasure and fishing craft have motors which are used as auxiliaries to wind power. About 1903, began the building and equipment of high speed craft and motor boat racing has become a very popular sport. The fastest boats are about 40 feet in length with 8-12 cylinder engines developing 250-400 H P. In the summer of 1910, the racer Dixie II went 30 miles at an average speed of 34.7 statute miles an hour. Long distance and endurance tests have also helped in the development of the motor-boat. Races have been run from New York to Bermuda and to Cuba. The distance from Bermuda to New York (650 nautical miles) has been covered by a motor boat in 78 hours, 52 minutes, and 50 seconds.

Motor Cycle. A cycle with an especially strong frame, propelled by a motor. The first motor cycle produced in the United States dates from 1868. It had a steam engine and was made and used by W. W. Austin, of Winthrop, Mass. It weighed 90 pounds, and is said to have run 2,000 miles. The engine and boiler were attached to the frame just back of the rider. In 1885 came the Copeland of San Francisco, a steam bicycle which was ingeniously compact in its construction and had a boiler holding enough water to last an hour. It went a mile in 8 minutes, on an ordinary road. But these cycles are of historic interest only. The present-day motor cycle is a bicycle, (the motor tricycle has never been adopted except in a few cases for parcel delivery pur-

poses) fitted with an air-cooled gasoline engine of from $\frac{1}{2}$ to 6 H P. The motor is controlled by the rider precisely as in an automobile, and is attached to or built in the frame. Gottlieb Daimler, of Dantz, Germany, in 1886, first fitted the gasoline engine to the bicycle. From 1900 to the present time increased attention has been given to motor cycles, and there are now many types upon the market. The rider uses the pedals until the motor is working, after which he does not use his feet except to assist the motor on steep hills.

Motors are generally used by one rider, although a few tandems have been made. Designs have been developed so as to make possible a "fore car" and "side car" enabling two people to ride. In these types twin cylinder motors are employed. The belt drive is now almost universal, the chain being found too hard on the tires. Two gear speeds are now employed, as well as magneto ignition and artificial lubrication. The motor cycle has developed great speed and racing has become a popular and exciting sport. In 1907, Curtiss, at Ormonde Beach, Fla., on a motor cycle made a mile in 46 2-5 seconds, and Huyck in 1909, at Springfield, Mass., went over 71 miles in a race lasting exactly 1 hour.

Motor Trucks for Commercial Use. The gradual passing of the horse-drawn dray and the increasing use of motor-driven trucks has been accentuated by the greater efficiency of motor cars over rough country. In some respects the most progress which has been made in relation to automobiles in the last few years is in this direction.

To prove the strength and reliability of motor trucks a contest was held in New York during Oct. 1910. Forty-nine motor-driven vehicles entered, some bearing very heavy loads, and demonstrated their possibilities not only in moving through congested districts but in passing over bad country roads. They showed in every instance their superiority for heavy work over horse-drawn vehicles. The contest was to show efficiency combined with cheapness of operation. Two classes entered, those used for distributing goods which are required to stop from 10 to 100 times a day and transfer wagons used chiefly for taking factory products from the suburbs into city warehouses.

For both classes difficult routes were selected, the former covering more streets, but the latter chiefly over hills and rough roads. One truck entered weighed 13,000 pounds and when loaded, the whole weighed 33,000 pounds, but it moved without difficulty over ordinary roads for 65 miles. Twelve per cent grades were negotiated by all entrants. One motor vehicle had been in hard daily service for nine years.

Mound Bayou Colony. Mound Bayou, Bolivar County, Miss., is a flourishing example of negro efficiency in town building. One of the secrets of success of the sturdy founders was that their enterprise was not an obnoxious competition with white men. Their idea was to establish an economic and social community of their own race for the purpose of bringing out and developing through application and example the best traits in the negro character.

The promoters of this colony were once slaves, but under the leadership of old Isaiah Montgomery they have planned and builded

MOUND BAYOU COLONY

so that the last vestige of the environment of slavery is now extinct.

To segregate the negro from the white race and yet have him prosperous and contented has been, heretofore, a problem that was considered incapable of solution, but Mound Bayou is a living contradiction of the assertion.

Mound Bayou is a town where no white man can own a foot of property, invest a dollar in its improvements or enterprises, or till any of its 40,000 acres of the rich delta soil known as "Colony Mound Bayou."

With the bare exception of \$10,000 put into a library building for the benefit, enlightenment, and advancement of the people of this unique community, by Andrew Carnegie, no man of white blood has a dollar in the colony. It is a town founded by negroes, built by negroes, and managed by negroes.

The site of Mound Bayou was very happily chosen. It lies in the very heart of the Delta country, where the soil is as rich as that of the far-famed valley of the Nile. The Yazoo and Mississippi Valley Railroad passes through the town. As the train nears Mound Bayou one notices the absence of the familiar broad plantations, with their palatial homes and many cabins. In their places are found innumerable small holdings, each worked by a separate negro owner or negro tenant.

The leading idea of Isaiah Montgomery, the founder, and the principal citizens of the colony, is race building. One of their chief characteristics is the entire frankness and complacency with which they regard the fact that they are black men and of a race that has come up from slavery. They have none of that assumption; that false pride that leads to complications in their every day association with white people, and that have made the race problem all the more difficult of solution. Even the leading men of the community refer to each other as negroes, and to their race as the negro race. Isaiah Montgomery lived in a romantic period whose cycles of success would have turned the head of many a less well-balanced man, even one with white skin. He was born a slave on a plantation that was the home of a brother of Jefferson Davis. Like every other slave he had nothing that he could call his own when the war brought about his liberation; to-day his wealth is variously estimated at from \$75,000 to \$100,000.

Two examples of the stamina, intelligence, and reliability that are predominating characteristics of the Mound Bayou negroes are J. W. Covington, editor of *The Demonstrator*, the newspaper of the colony, and Charles Banks, cashier of the Mound Bayou Bank, a financial institution that started its existence with a capital of \$10,000, which soon amounted to \$25,000.

Covington is a man of more than ordinary intelligence, who conducts a most creditable publication with an ever-present determination to better and build up his people. In his mind and his utterance there is a dominant note of hope and efficiency. He not only admits his race is behind, but he is ever engaged in the work of improving it, and is constantly, though perhaps unconsciously, manifesting his pride in the strides that have been made and the stability with which the social structure is being built.

It was Banks who first advocated before the convention of the Negro Business Men's

League of Mississippi, ideas that would broaden the racial activities and encourage the business and mechanical development of the negro people, and whose efforts resulted in the establishing of a cotton-seed oil mill at Mound Bayou. The stock was placed at \$4 a share so that every negro in the State might have an opportunity to invest his savings in the enterprise. Banks is also cashier of the Bank of Mound Bayou. It was through his energies that it was organized and through his efforts mainly it has been built up to a stable institution. It has deposits of upwards of \$50,000, and has on a single day transacted more than \$22,000 of business. It handles without difficulty the cotton, lumber, and various other industries of the community, and in the financial flurry of 1908 it continued specie payment when many of the white banks of the State had to resort to cashier's certificates.

Every official of Mound Bayou is a negro, and even the white sheriff of Bolivar County does not intrude officially on the colony, but appoints a colored deputy to represent him in that district. There is, however, little use for officers in this colony of black people. It is almost a proverb with them that the deputy sheriff and the constable are the only idle men in town.

As an example of how their affairs are regulated and the respect they have for law and order may be cited an incident that occurred in 1905. It had been discovered that several "blind tigers" were being operated in the village. The matter was thoroughly discussed at a meeting and the sentiment emphatically expressed that this character of lawlessness would not be tolerated, and the illicit places then and there ceased to exist.

It was not many years ago that the local option party of Mississippi made a strenuous effort to abolish local option in Bolivar County, and the whiskey element ascertained that the success of the movement hung on a half dozen franchised voters of Mound Bayou. They immediately set about to endeavor to corrupt these voters. This move came to the knowledge of the colony; a citizen's meeting was called and the suspected voters were reprimanded in a stern but kindly way. It was reasoned that saloons and rum shops in the county, even though not in the colony, might demoralize some of the members of the colony and result disastrously. Accordingly, the village delegates were instructed to cast their ballots with the prohibition party of the county, and that saved the day in Bolivar for prohibition.

If a white man desires to spend the night in Mound Bayou he finds that certain rooms in the hotel are reserved exclusively for white guests. He eats at his own table, in his own room. For distinguished white visitors a pretty cheerful room is set aside in the home of Isaiah Montgomery.

If a negro colonist of Mound Bayou does not own his land he rents it from a member of his own race at a standard and reasonable cash rental. His cotton is hauled to the gin of the colony, it is stored in the warehouse there, and it is sold in the market of Mound Bayou at the best market price. He buys his provisions, his fertilizer, and his livestock in the town and gets his lumber and building material from the Mound Bayou lumber yard.

MOUNTAIN CLIMBING

If he needs ready money he gets it at legal rate of interest from the Bank of Mound Bayou, which is able to finance every institution of the place. His medicine is got from a Mound Bayou doctor, and his teeth are looked after by a Mound Bayou dentist, and when the end comes he is laid away by a Mound Bayou undertaker. Through this principle of spending what they get from the soil among themselves the community of Mound Bayou thrives. There are about 50 stores in the town, and the business of the shops and cotton industries puts about \$600,000 annually in circulation. The chief industrial enterprises are an oil mill four cotton gins, a sawmill, and a lumber yard that exports staves, lumber, and ties.

In the matter of facilities for religious worship and for education Mound Bayou stands well equipped. Here all the principal church denominations are represented, the congregations being strong numerically and the houses of worship being structures of which the people may well be proud. The Green Grove Missionary Baptist Church has a membership of 600, and the house of worship has a seating capacity of 1,000, and the church maintains a monthly publication, the *Baptist Echo*. Then there is the Bethel African Methodist-Episcopal Church, the Christian Church, the Jerusalem Baptist Church, and others of various denominations. The services are well attended and ably conducted.

The character of the schools of Mound Bayou, the methods of administration, the scope of the curriculum, and in short, the entire operation of the school system must command admiration. The Mound Bayou Normal and Industrial Institute is an especial point of congratulation to the people. They point with pride to good work it has done, and the splendid progress it has achieved during the 16 years of its preeminent usefulness. It carries an enrollment of 200 pupils, and from it have passed many young men and women who have proved in every way a credit to their race.

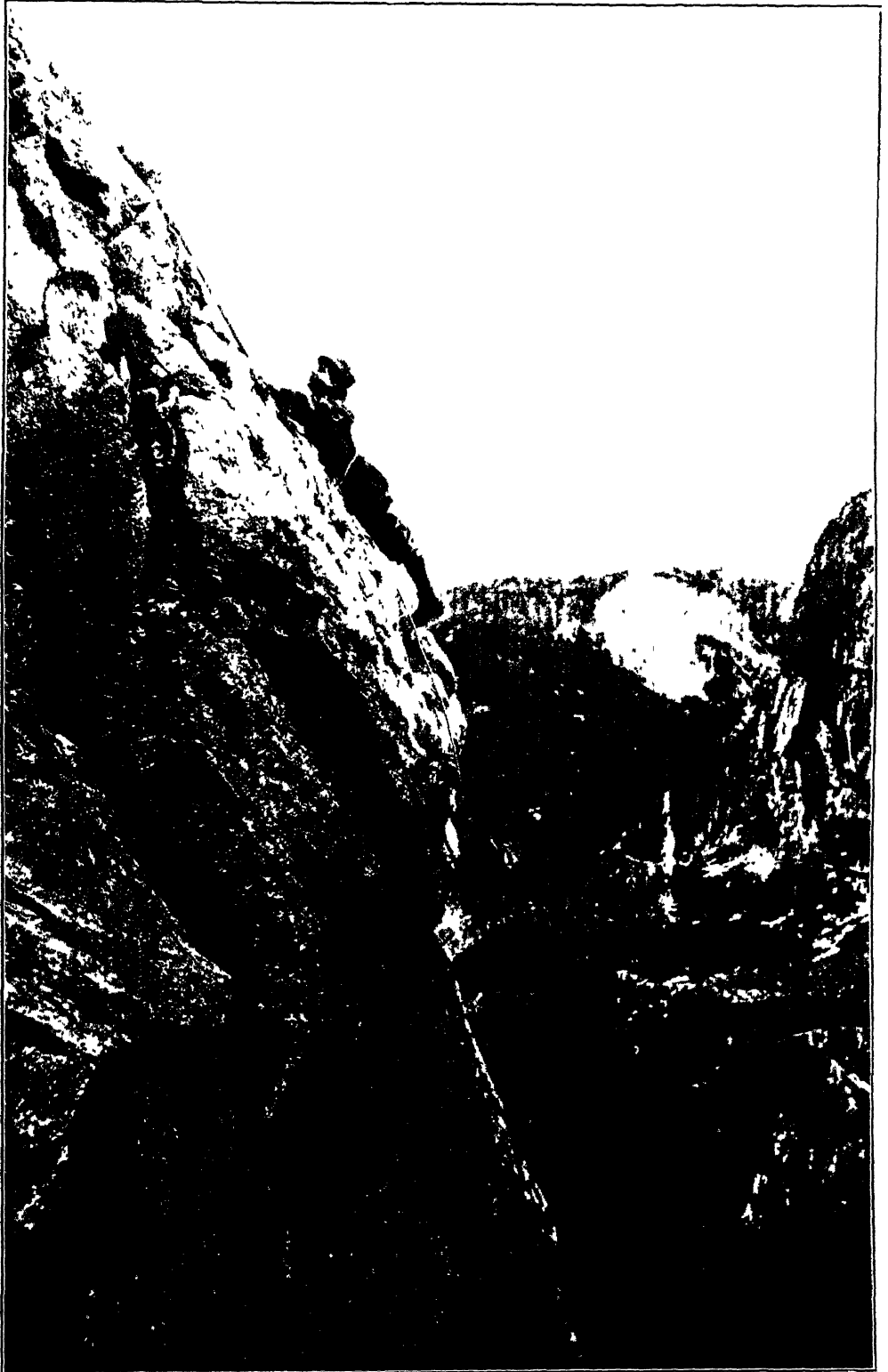
The Baptist College carries an enrollment of about 200 students and is a most thoroughly conducted and highly creditable institution. Besides these two institutions there is a public school that is as admirably and successfully conducted as any of the public schools of the State, and which also has an enrollment of over 200 pupils. With such an array of scholastic facilities who can dispute the assertion that the negro citizens of Mound Bayou are seekers for knowledge and earnest workers in the field of race enlightenment and race upbuilding.

Mountain Climbing. By far the most important development in the history of mountain climbing in the year 1910 was the Parker expedition up Mt. McKinley. This trip was stimulated by the general disbelief in the claims of Dr. Frederick Cook to the discovery of the North Pole. Before laying claim to this explorative triumph Doctor Cook had announced reaching the summit of Mt. McKinley, writing a book on the subject, illustrated with many photographs taken by himself which were intended to substantiate his claim. The Parker expedition proved conclusively that, as was the case with the Polar claims, Doctor Cook's assertions in regard to his ascent of Mt. McKinley were utterly without foundation, and on that

account caused widespread interest. Aside from this, however, the Parker expedition had a distinct scientific value of its own, and there can be little doubt that that party reached a higher point on this gigantic summit than had ever been previously attained. The topmost point of McKinley, however, still remains unconquered. The Tom Lloyd party, which set out from Fairbanks, Alaska, maintains to have got to the top, but their proofs have been deemed inadequate by experts, and scientists generally are inclined to regard their claims lightly. The party which set up the record of 1910 consisted of Prof. H. C. Parker, of Columbia University; Prof. J. H. Cuntz, of Stevens Institute; Waldemar Grassi, of New York; Herman L. Tucker, of the United States Forestry Service; Merl La Vey, and J. W. Thompson, of Seattle; Arthur Aten, of Valdez, Alaska; and Belmore Browne, of Tacoma. This was probably the best equipped expedition from a mountain climbing standpoint that has ever been organized in the United States. The net results of its explorations, aside from the refutation of the Doctor Cook claims which it set out to disprove, was a map of a hitherto unknown stretch of mountain wilderness, and the proving beyond all reasonable dispute that Mt. McKinley is unclimbable from the southern side. The Parker party attacked the mountain from no less than five different points, only to be stopped in each case by insurmountable difficulties. The real work of ascent began finally on 2 June. At all times the going was found to be very difficult. Biting cold prevailed all the way, long stretches of rough ice made progress very slow for long distances, while the packs of the explorers, averaging as they did at the start 70 pounds, retarded advancement still more. All things considered, however, the Parker expedition represents a very distinct triumph in the history of mountain climbing. Mountaineering technicalities had absolutely nothing to do with the failure of the party to reach the summit of the giant peak. At each attempt to attain the latter the climbers were met by straight walls of ice and snow and crevasses and bergschrunds which could in no way be bridged or avoided. The Parker expedition finally attained a height of 10,300 feet, which, if the claims of the Lloyd trip are set aside, constitute the best record yet set up in the attempts to scale this mountain. During the earlier stages of the journey up the mountain side the Parker party followed the course taken by Doctor Cook in his famous journey, and took photographs along the way of all the places and peaks which the Brooklyn explorer photographed in the course of his own climb. The picture which Doctor Cook published under the title of the "Top of the Continent," purporting to be the highest point on Mt. McKinley, was found to be an isolated rock in Amphitheatre Glacier, 20 miles southeast of the base of Mt. McKinley itself, and at an elevation of only about 5,000 feet. This for all time disposed of the last vestige of a claim to having actually attained the summit of Mt. McKinley which Doctor Cook may have still retained.

Mountain climbing in 1910 accounted for one serious tragedy. Mt. Blanc, the famous Alpine peak which has caused the death of so many daring explorers, was the scene of the latter. Three men, residents of Geneva, all

MOUNTAIN-CLIMBING



One of a Mountain-climbing party on the Little Mithen, Switzerland.

MOUNT MCKINLEY—MOUNT WILSON CONFERENCE

of whom were comparative amateurs at mountain climbing attempted the ascent of this difficult height unattended by guides. They had proceeded a considerable distance with good success and were nearing one of the shelters, when two of the party became exhausted and were unable to continue. The third, however, who apparently possessed more endurance, persisted in pushing on toward the shelter, where he hoped to procure assistance for his fallen comrades. He, too, however, gave out on the way and sank down exhausted. Four guides witnessed the predicament of the party from a distance and tried to reach the fallen man, but failed. Meanwhile one of the men who had first succumbed, M Reymont by name, was overcome by the cold and died before help of any sort could reach him. The other two men managed to revive and made their way to the foot of the mountain by the following morning. A party of guides immediately set out after the body of the dead man, and at length succeeded in getting it back to St Gervais after great difficulty. The incident, groomsome as it was, served as a distinct lesson to amateur mountain climbers, and no party attempted the ascent without the aid of guides during the remainder of the year.

During 1907 Dr. Sven Hedin climbed many mountains in the ranges of Tibet, but the results of his explorations, although noteworthy in the extreme, were important more from the standpoint of archaeology than of mountain climbing. During the following year Miss Annie Peck, the woman mountain climber who has attained so much prominence through her consistent daring, achieved a notable feat when she reached the top of Mt Huascarán in Peru. Miss Peck became involved in an animated controversy, however, in the course of which even the authenticity of her claims were disputed by asserting that one of the two summits of this huge mountain was more than 23,000 feet high. Mrs Fanny Bullock Workman, who is credited with having made the highest ascent ever recorded by a woman, was the person who assailed Miss Peck's figures. In an effort to prove her side of the dispute she sent three French topographers to Huascarán the following year to make scientific measurements. They set the heights of the two peaks at 22,187 and 21,812 feet respectively. During this same year many scientific measurements were also made of the highest peaks in the Himalayas, while in May 1909 the Duke of the Abruzzi attempted to scale Mt Godwin Austen. He did not succeed in his intent to reach the top, but did attain the very creditable height of 19,100 feet.

Altogether, there are records of 170 persons who have perished during the year from 31 Oct. 1909 to 31 Oct. 1910 in their efforts to scale the Swiss and Italian Alps, while 80 other climbers were seriously injured. The Swiss head the list of victims, being followed in order by German, British, American, and Italian tourists. The causes of the greatest number of fatalities were attempts to climb without the aid of a guide, as in the foregoing case, avalanches, sudden storms, and heart failure in the rarefied atmosphere.

Mount McKinley. See MOUNTAIN CLIMBING

Mount-Stephen, Lord George Stephen, Canadian financier: b. Dufftown, Banffshire.

Scotland, 5 June 1829. His parents were in very moderate circumstances and he began life as a herd boy, later working as an assistant in the shop of a London draper. In 1850 he went to Canada and from that time his advancement was rapid and he became one of the most influential men in the Dominion. He was a director, vice-president and president of the Bank of Montreal, was president of the St. Paul and Manitoba Railway and was president of the Canadian Pacific Railway until 1888. He was created a baronet by King Edward VII in 1886, and in 1891 was created a baron, being the first man in the colonies to receive this distinction. He was also made a commandant of the Royal Victorian order in 1905. Lord Mount-Stephen is one of the most intimate friends of King George and in Dec 1910 entertained the King and Queen at his home at Bocket Hall.

Mount Wilson Conference for Solar Research. The most eminent astronomers and astro-physicists of 13 nations came together at the Mount Wilson Conference for Solar Research in 1910. In point of work accomplished this session was the most important of any thus far held. The International Union for Cooperation in Solar Research was founded at the St. Louis World's Fair in 1904, its original object being, as the name implies, to study only the sun. At the Mount Wilson conference, however, it was voted to enlarge the scope of the Union so as to embrace also study of other planets and stars. The delegates present from all the great observatories of Europe and the United States were chiefly interested in observing the remarkable achievement of George Ellery Hale in founding this, the greatest observatory in the world, and doing it all within five years. The immensity of this task became all the more apparent when it was realized that all the materials in the buildings, and all the heavy instruments had to be transported over devious mountain trails to the lofty summit, while in some cases new roads of great width had to be constructed—all at enormous cost.

The equipment which was shipped with this great labor is the most elaborate in existence, costing over \$1,000,000. The astronomical authorities at the conference marvelled at the power of the huge 60-inch reflecting telescope which weighs many tons, yet is under electrical control equal to that of a laboratory microscope. With the opportunity of utilizing such superb instruments before them the delegates permitted themselves practically no sleep. The great dome was open every night, and the telescope not permitted to remain idle for so much as a minute. The celestial scenery on display consisted of the giant cluster in Hercules, the ring nebula in Lyrae, Saturn, and the nebula in Orion. Through the sixty-inch reflector the astronomers were enabled to see with a clarity which no other instrument of the kind had ever afforded them. They averred that the confused mass of stars was no longer compact to their vision. Countless orbs stood out separately, even down to the 18th and 20th magnitude, while the nebulae in Lyrae became a vision of incomparable beauty, with its bright central stars, all clear as day. Many of the delegates saw for the first time for themselves that the rings on Saturn are complex, while the dark or crape ring seemed to be much wider

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and nearer the planet than is shown by smaller telescopes. A tinge of blue was also discovered on the Saturnian south pole and yellow bands toward the equator

The Mount Wilson tower is of steel, 150 feet in height, surmounted by a revolving dome, likewise of steel. Within the latter is an inclosed vertical steel frame 5 feet square, also 150 feet high, which excludes air currents. A tubular excavation 78 feet deep into the solid rock is a continuation—so that from the lens on the top to prisms and different gratings at the bottom, there extends a clear band of protected light 228 feet in length. Mirrors revolving by means of clocks throw this band of light from the sun through the lens and this projects a splendid image of the sun, 16 inches in diameter, into the interior of the mountain far below. At the 1910 conference this solar image was subjected to daily and hourly study the like of which has been previously unknown. Spectrographs, spectroheliographs, polarizing, and magnetic apparatus of great power and intricacy were applied. Sun spots, prominences, and their spectra were constantly photographed, and a record secured of the chromosphere and photosphere, and magnetic phenomena on display during the life histories of the huge sun spots.

The astronomers also took advantage of the innumerable instruments which the Wilson observatory affords for measuring light, heat, and visible and invisible radiant energy pouring upon this peak in clear air from sun and stars.

The most noteworthy paper read at the Conference, aside from the actual operative work which was accomplished, was the classical lecture of Prof. J. C. Kapteyn, of the observatory, Groningen, Holland. This was supplementary to the notable one which he delivered at Pasadena in 1908. His new material covered investigations made on 81 Orion stars and revealed a gigantic movement of the stars through space in two streams. The larger stream is in the constellations Scorpio and the Centaur in the distant south, while the smaller, or northern, is passing the area included in Perseus. Other proceedings for the most part set on foot investigations which will be followed up and reported upon at the next conference.

Moving-Picture Machines. Long before the invention of the flexible photographic film made possible the ingenious moving-picture machines of the present day, scientists had sought a means of representing motion. A Belgian physicist, Plateau by name, in 1833 devised a singular instrument, which he called the phenakistoscope for the purpose of demonstrating the fact that luminous impressions upon the retina of the eye are not instantly removed when the light is quenched but continue to affect the optic nerve for a sensible period of time. The principle of M. Plateau's instrument was put to some practical use in the zoetrope, a toy in which a series of pictures of an object, such as a horse in different positions, was put within a hollow revolving cylinder with a band of short perpendicular slits perforated in its circumference. To an eye placed in front of these slits, the effect when the cylinder containing the strip of pictures was rapidly revolved, was to give a representation of a running horse. In a variety of the zoetrope known

as the praxinoscope, the invention of a Frenchman about 1870, the succession of images was reflected in a many-sided mirror placed within the cylinder. A series of reproductions of drawings, not photographs, were used in these instruments. About 1877 Edward Muybridge, an American scientist, was engaged in studying the motion of the horse. He placed a number of cameras in a row, attaching a long thread to the shutter of each. In front of this line a horse was made to pass so that the shutters were operated by the breaking of the threads as the animal went by. Muybridge took the resulting positive plates and arranged them on an immense revolving disk which brought the pictures rapidly one after another into the light of a projecting lantern. This apparatus he called the zoopraxiscope, and its invention marks the practical beginning of chronophotography, as the branch of the art devoted to moving pictures is called. Other pioneers in this field, Prof. Stephen Marey in France who investigated the flight of birds, and Professor Anschütz of Germany whose tactyscope (1887) was somewhat similar in principle to the kinetoscope suggested by Thomas A. Edison, a series of positives printed on the periphery of a large glass disk. The invention of the flexible celluloid film (about 1888) worked a revolution in all branches of photography, but to none has it been of such importance as to chronophotography. Edison abandoned the idea of the glass disk and patented his kinetoscope in 1891. Moving-picture machines known by various names are the vitascope, vitagraph, biograph, kinematograph, etc., similar in principle if differing in details, have since been put upon the market. They consist of a projecting lantern operated by electric, calcium, or magnesium light, an apparatus through which the film is passed, and a powerful magnifying lens, in front of which is a shutter that may be opened and closed by motor power with great rapidity. The moving picture is taken by a camera with an exceedingly rapid shutter, making from 15 to 30 exposures a second. The shutter is operated by a small motor. The film, which is 1 3/8 or 2 3/8 inches wide and 55 feet long, is fed behind the shutter and receives an impression at each exposure. A positive strip is developed from the developed negative, and this is passed through the moving picture machine just as the original film is fed to the camera, the lantern projecting the image on a screen at each opening of the shutter. The illusion of motion in the projected picture is due to the fact that the retina of the spectator's eye has the property of "persistence of vision" referred to above. On account of this the image remains while the shutter of the machine is closed, and persists for a sensible period after the next of the series is shown, the consequent superposition of the two images on the retina with the statuary parts of the pictures in the same position and moving parts slightly changed, giving the sensation of an object in motion. The eye receives 900 of these impressions every minute. A number of films are sometimes necessary in representing a scene and for some events several miles of celluloid strips have been used in recording their progress. Another form of moving-picture machine is the familiar mutoscope which operates when a coin is placed in a slot, the spectator viewing

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the scene through binocular lenses. Here each picture of the series is cut from the film and arranged on a roll, which, rapidly revolving when set in motion, brings them successively in position before the eye. Pieces of opaque cardboard are placed between the separate pictures, and these act as "cut-offs" in the manner of the shutter of the cinematograph. The exhibition of these pictures has proved an exceedingly popular form of amusement within the last few years and moving picture shows abound all over the civilized world. In the large cities they compete strongly with the older forms of dramatic representation, and they thrive in 800 places too small to support a regular theatre. In Italy and Spain they have played sad havoc with the puppet show and other dramatic efforts which for centuries have been dear to the hearts of the people. The representations, as usually given, may be divided into two classes, (1) the reproduction of processions, races, the passing scenes of a city's streets, etc., (2) dramatic performances, athletic contests, and similar events. The "plays" produced in moving-picture exhibitions are often marvels of ingenuity and startling in their effects. The best of them are now made in France, and subjects are worked out by experienced actors in front of the photographic lens, and while the photographed play is reeled off before the spectators in a few minutes, its preparation is a lengthy process. The apparent impossible feats of the performers as depicted on the screen are the result of operating the camera up to a certain critical point of the action and stopping it suddenly. Then the scene is entirely rearranged for the next position and the camera started again. Thus the developed film shows no break in the continuity of action, although some quite superhuman feat may be represented as having actually transpired.

Moving Pictures. The growth of the moving picture industry in the United States has been one of the most rapid and important in recent years. The moving picture house has truly come to be the "peoples' theatre." To fully appreciate how true this is one must have recourse to figures. The following is a list of the moving picture houses supported by the leading American cities during 1910: New York, 450 theatres, with a seating capacity of 150,000; Chicago, 310 theatres, with a seating capacity of 93,000; Philadelphia, 160 theatres, with a seating capacity of 57,000; St. Louis, 142 theatres, with a seating capacity of 50,140; Cleveland, 75 theatres, with a seating capacity of 22,500; Baltimore, 83 theatres, with a seating capacity of 24,900; San Francisco, 68 theatres, with a seating capacity of 32,400; Cincinnati, 75 theatres, with a seating capacity of 22,500; and New Orleans, 28 theatres, with a seating capacity of 5,600. When it is remembered that all of these houses are filled not once, but four, five, sometimes half a dozen and more times a day some idea can be gained of the vast number of people who attend this form of amusement. To supply the immense public demand for moving pictures requires almost ceaseless work on the part of the producers. The chief combination of producers who control the field for the most part turn out on an average of 20,000 feet of new films each week, at the same time making fully 80 copies of each. The royalties of Mr. Thomas

A. Edison from this source amount to about \$3,000 a week. The middlemen, or "exchanges" pay the manufacturers \$9,000,000 for films, which the former rent at about \$18,000,000 a year to the actual exhibitors or showmen. They in their turn collect stupendous sums from the public, all in nickels or dimes. During the year 1909 the paid admissions from 10,000 ticket windows alone amounted to \$57,500,000. The audiences which supplied this enormous sum numbered more than two and a quarter million persons per day—a number three times as great as the total of the aggregate audiences of all the regular theatres in America put together. This number, too, is being augmented every day and it is an axiom in the business that "once a moving picture patron, always a moving picture patron." The facts seem to more than bear this out.

As the moving picture has grown in popularity, the standard of the exhibitions presented has already persevered toward a higher and higher level. Manufacturers and producers alike fully realize the responsibility which is placed upon them in catering to such large audiences, and are striving to make the entertainments they give of real value to their patrons. Time was—and it was not so very long ago, either—when the moving picture constituted a very grave menace to the public morals. The films shown usually depicted murders, suicides, runaways, train robberies, and other gruesome spectacles, which were bound to make their imprint on weak, receptive minds. Murders have been perpetrated which have been directly traced to the influence of this type of moving picture—murders in which every detail as enacted on the screen has subsequently been faithfully followed by the murderer. Fire-bugs have resulted from continued attendance at the old-style moving picture performances. Children have been moved to attempt the methods of the "Black Hand," and any number of petty criminals and burglars have received the initial inspiration for their crimes while watching the gross, morbid films of the old-style entertainments. Affairs finally came to such a pass that "moving picture show" came to be a synonym for all that was lowest and most debasing in the form of entertainment, and careful mothers guarded their children from moving picture houses as from a plague. To-day all this is changed, however. The best sort of people are regularly seen at moving picture playhouses, while the tremendous influence such resorts wield has been thrown almost entirely toward the advancement of education and inspiration. There is practically no end to the valuable work the moving picture has been made to do, and so fully have its value and its worth been recognized that it has even found its way into churches in several parts of the United States. This great metamorphosis, too, has all come about comparatively recently.

It was at the sincere desire of the moving picture men themselves to remove the ban under which they had been placed by nearly all decent-minded citizens and at the same time make themselves forces for uplift and for good in the world that the first step toward the regeneration of the moving picture business was taken. Their own desire, however, was greatly augmented by an important practi-

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cal step toward eliminating pictures which were dangerous, and encouraging those that were wholesome. This step was the formation by the People's Institute of New York of the National Board of Moving Picture Censorship. This board is composed of public-spirited men and women, persons of high professional standing, representatives of the municipal government, and of social organizations. The headquarters of the board are located at New York City, which is the centre of the moving picture industry, at least of the manufacturing side of it. Twice each week the committee meets and inspects all the films which are to be sent out for general public exhibition. The board acts in perfect harmony and accord with the main combination of manufacturers, who from the outset of the movement have welcomed the censorship, and at the same time a large number of the independent manufacturers voluntarily submit their own films for the approval of the committee. All this is but one indication of the growing conscience of the moving picture men. No set of films is given out for public inspection until it has been first reviewed and approved by the National Board. As the various films are shown to the committee they are discussed not only with regard to their suggestiveness, but also with a view to their probable influence on the imagination of the weak-minded, the poorly educated, and the ultra-susceptible. Moving pictures reach the young and impressionable portion of the country's population, family groups, and the immigrant contingent, and the censorship of them has to be all the more rigid on this account. All these facts the board takes into consideration in passing its judgment, and no picture which is deemed in any way liable to do harm to the morals or minds of any of the classes who are likely to witness it is allowed to pass. Thousands of dollars worth of films have been cheerfully destroyed by the manufacturers at the suggestion of the board of censorship since the creation of that body. The result is the uniformly clean, wholesome style of moving picture exhibition which are to-day to be witnessed in all parts of the United States.

Out of 2,900 films examined recently by the board of censors no less than 900 were classed as directly educational by those who passed judgment upon them. The rest were for the most part listed as "serious drama" which has a value peculiar to itself. The educational film, however, is popular, both with the public and the manufacturer. In securing the effects produced in these no amount of expense is spared. One manufacturing company, for instance, in order to make a realistic war-time set of pictures, hired the use of an entire railroad in Florida. Another company, in depicting how an evil man came to grief, sent an automobile originally worth \$4,000 over a steep cliff. Where historical plays are put on a vast amount of work and expense is lavished that they may be as nearly perfect as possible. Historical accuracy is never sacrificed because of cost involved and the most splendid effects are oftentimes attained through such performances. The value of the historic lessons which are imparted to the audiences through this medium is almost inestimable. Nothing teaches so effective a lesson as actual sight, and this is exactly what the moving picture holds out to the patron. The works of almost all the great

masters of literature has been staged in this way by the moving picture machine. All of Shakespeare's plays have been produced thus, and for some of the performances even such celebrated theatrical artists as Mme Sarah Bernhardt and the late M Coquelin have lent the aid of their art to the moving picture producers. Probably the finest set of films ever exhibited on any moving picture screen was that illustrating the life of Christ, which was put on at a cost of \$10,000. Both from an educational and an inspirational standpoint this possessed great value.

The Government has also made use of the moving picture film in gaining recruits for the navy. This movement began with the exhibition of a few films depicting naval drills, and out of these grew real dramas, showing forth the spectacular side of the midshipman's life in its most glowing aspect, with a love interest as a rule interwoven. Through witnessing this type of picture, it has been estimated that numerous young men who would otherwise never have conceived of following the sea as a means of livelihood have been induced to enter the United States navy. Travel pictures are also extremely popular and are very widely exhibited. These, too, possess much educational value. All the storied castles and ruins of Europe are depicted on the moving picture screen, the canals of Venice, the glories of ancient Greece, the mysteries of the pyramids and of all ancient Egypt, the natural beauties of Ireland and Scotland, the interiors and exteriors of old, historic cathedrals and fortresses—in fact, every conceivable phase of foreign life, still or active—from which beholders can derive lessons which years of reading, which they would probably never undertake in the course of their lives anyway, could not hope to give. There is scarcely a subject which the thoroughness of the moving picture manufacturers has allowed to escape them. Among the educational films presented are included also many unique and interesting phases of geography, botany, etymology, ethnology, surgery, pathology, biology, geology, and bacteriology, while zoology, ornithology, microscopy, mineralogy, metallurgy, and aeronautics, as well as the other subjects before mentioned. Besides embracing all these topics, the moving picture affords an excellent opportunity to a man who has not yet learned to read of keeping abreast the most important events of the world's progress in all lines of endeavor and activity.

Enlarged moving pictures have shown the housewife the action of germs and bacteria on various common household foods, when they are allowed to remain unprotected on kitchen tables, and the work which the films have done through this medium in making for uniformly sanitary conditions in unnumbered homes, and saving lives in consequence is practically incalculable. Recently even the flight of a bullet has been visualized by means of this marvellous science. This was done during 1910 by the fastest moving picture machine which the world has yet seen, an invention of Professor Cranz, private counsellor to the Emperor of Germany and instructor at the Military High School at Charlottenburg. This machine, the details of which its inventor is keeping secret, is known to be capable of six thousand images in the space of one second. In depicting the

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flight of a bullet it shows the missile leaving the barrel of a revolver ahead of the smoke from the discharge, and finally striking a human bone. It is believed that this set of films will furnish many new details to science on the effects of bullets and projectiles after being discharged. Professor Cranz's machine is also capable of illustrating so minute a thing as the vibrations of the wings of small insects in flight.

In all sections of the United States churches have for some time employed moving pictures in their evening services, and in some of the more spectacular churches the films have been used to illustrate sermons. At first, the movement was taken up by religious organizations in order to combat the pernicious influence of the moving picture houses when they were at their worst by giving in the same form of entertainment improving subjects. Now that the necessity for this has departed, however, the churches still continue moving picture entertainments as a means of popularizing their services, and they not only give films of an improving popular nature, but also illustrate the whole of the Old and New Testaments by this means. Some churches have been criticized by the most conservative elements for this action, but it has proved its own worth in the long run. Many schools have also employed the moving picture as a means of instruction, and great success has attended this custom wherever it has been practiced. An English concern has even gone so far in the perfection of moving pictures as to bring out colored films. By means of the latter the growth of flowers has actually been shown, this feat having been performed during 1910 before the New York Electrical Society. Eminent surgeons are even now seriously considering the teaching of surgery by means of moving pictures. They say that a moving picture of a competent surgeon performing an intricate operation, where his every slightest move could be shown beyond all misinterpretation to the student would prove a more thorough and effective method of instructing in the proper methods of surgery than any number of unillustrated lectures. It now appears highly probable that this form of instruction may become general before a great while, for there is no single field in which the moving picture has made greater strides than in that of medicine. In Oct 1910, for instance, a series of pictures was put on exhibition in London that had been obtained through the agency of the X-Ray. In these films the stomach of a man was thrown on the screen, and all its regular workings clearly shown. By the same means the workings of the human brain have also been illustrated. The benefit which such pictures will prove to scientific research is undeniable.

And so in all fields the moving picture is to-day doing its work and doing it well. We have no censorship of the drama in the United States as they have in England and some other foreign countries, but we have a censorship of moving picture entertainments, and as a result most people who are in touch with the situation proclaim the moving picture playhouse a clean and wholesome place of popular amusement. The National Board of Censorship is doing its work well. Where it does err, as

sometimes happens, public sentiment can be depended upon to come to the rescue, now that the country at large is beginning to awake to the vital importance of the moving picture as an educational and inspirational influence.

And now the latest development—a development which seems destined to gain even more patrons for the moving picture, and to increase its power immeasurably has been brought to perfection by that tireless worker, Mr Thomas A. Edison. It is moving pictures which can talk. For a number of years, realizing that the moving picture house was probably the greatest educational agency in the land for the great bulk of the working people, Mr Edison has been working on this invention, with a view to making the entertainments of the people more complete and more helpful. He has at last met with some meed of success. Before a small selected audience at his New Jersey experiment station, Mr Edison, in August 1910, gave a demonstration of what he has accomplished in this line. He has not yet got it to such a fully developed stage that he is willing to put it to the test of an elaborate public performance, but the first great triumph has been won, and the second therefore should not be far distant. Meanwhile moving pictures are doing their work every day in the year. They are doing that work for 20,000,000 of people each day who pay admissions to the regular houses all over the world, besides the numbers who have the benefits of free exhibitions at schools, churches, and like places. The moving picture house is now fully established, not only as the people's theatre, but as the people's teacher.

Muhlenberg Monument. A monument to Gen. Peter Muhlenberg, the "fighting parson" of the Revolutionary War was dedicated at Philadelphia, Pa., on 6 Oct. 1910. The statue is of bronze, nine feet in height, standing upon a seven-foot granite pedestal. On the front of the pedestal is shown in bronze relief the scene in Pastor Muhlenberg's church at Woodstock, when he quit the pulpit for the army; while on the back of the monument is the seal and motto of the German Societies. J O Schweitzer, of Philadelphia, is the sculptor. Gen Louis Wagner was chairman of the committee of prominent Germans which had charge of the erection of the memorial, and he presided at the dedicatory exercises. There was a large parade of German societies and addresses were delivered by Dr. C. J Hexamer, president of the National German Alliance; Mayor Reyburn, and Dr. A Murdra, German consul in Philadelphia. Muhlenberg was the man who uttered the famous words: "There is a time for all things—a time to preach and a time to pray; but there is also a time to fight, and that time has now come." He served throughout the war with great distinction. At its close he successively represented Pennsylvania in the House of Representatives and in the Senate. When Statuary Hall was established in the capitol at Washington, Pennsylvania chose Muhlenberg as one of her two sons who should be honored with statues there.

Muldoon, Peter James, American R. C. bishop, b Columbia, Cal., 10 Oct. 1863. He attended the schools at Stockton, Cal., and St. Mary's College, Kentucky, studied theology at St. Mary's Seminary, Baltimore, Md., and was

ordained priest 18 Dec. 1886, by Bishop Laughlin, in St. James' Pro-Cathedral, Brooklyn, N. Y. He was assistant pastor of St. Pius' Church, Chicago, Ill., 1887-89, was chancellor and secretary of the diocese, 1885-95, and pastor of the St. Charles Borromeo's Church, Chicago, 1895-1908. On 11 June 1901 he was appointed titular bishop of Tamesus, Cypress, and auxiliary to Archbishop Feehan of Chicago, and was consecrated at Holy Name Cathedral, Chicago, 25 July 1901, by Cardinal Martinelli, assisted by Bishops Cosgrove and Ryan. On 15 Dec. 1908 he was translated to the bishopric of Rockford, Ill.

Muller, Augustus, Roman Catholic missionary b in Germany, 1841, d 1 Nov 1910. At the age of 20 he entered the Jesuit novitiate of the New York and Canada Mission near Montreal. He taught several years at St. John's College, Fordham, N. Y., and made his higher studies in the Seminary at Woodstock, Md. He offered himself for missions in the East, believing that he might minister to the bodily as well as to the spiritual ailments of the people; and at his arrival, in 1879, in Mangalore, India, as a professor of St. Aloysius' College, he possessed a small box of homeopathic remedies which he had obtained in Paris. Aided by friends he opened the Homeopathic Poor Dispensary in 1880. Then he undertook to aid the lepers, and at great sacrifice he built an asylum for them. Then came the Hospital for general diseases, as well as a Poor House and Plague Hospital.

In 1891 he erected a large dispensary at Kankanady, to which a new wing was added in 1905 and another in 1906. Every day he received applications for advice from patients from all parts of India, Ceylon, and Burma, for whom he prescribed gratis. People of every class, rich and poor, came for consultation to the out-patients' department of the Dispensary in charge of his assistant, Dr. Fernandes. The number treated here daily was about 100, the poor free of charge.

St. Joseph's Leper Asylum came under Father Muller's management in 1890. He removed it to a more suitable site in 1892. It contained 10 rooms, five for men and five for women patients. In 1896 a chapel was erected. The increase in number of lepers amounting to 47 in 1908, made enlargement of the building necessary. It is open to all castes and creeds, and would care for more patients were it not for an ordinance of the District Board barring admittance to those from outside the district.

In 1895, Father Muller opened a small hospital consisting of two large wards and a chapel, for the relief of the poor Catholics of Mangalore and its suburbs. It was built from contributions raised in the town of Mangalore and a donation from Count Cæsar Mattei, of Bologna. It accommodates 36 patients, but so many of the sick poor applied for admission that, in 1901, Father Muller sought and received from all parts of India contributions for a new building. This cost 12,000 rupees, of which 5,425 rupees were given by the general public.

In 1902 the bubonic plague appeared in Mangalore. The Catholics subscribed nearly 5,000 rupees for another hospital. It was built in 27 days of durable laterite stone, and accommodates 24 patients. The number of plague patients treated here in the next 5 years was 118.

In Nov. 1907, the town of Mangalore and the whole district of South Canara suffered from a violent epidemic of cholera. Father Muller opened a cholera camp, and used the Bubonic Plague Hospital, which had been for some time without patients. Within a year, 150 cases were treated, of which number 115 were completely cured.

At that time, he was presented with the K. I. H. Medal by Sir Arthur Lawley, representing King Edward VII, Emperor of India. "Rev. Father Muller," said his Excellency in his public address, "I take it that the purpose in view when the bestowal of the Kaiser-i-Hind Medal is determined on is to make known as widely as possible the recognition of services of exceptional merit rendered to India and her peoples. The Church to which you belong has, decade after decade, been a practical and living exposition of the teaching of Christ—self-sacrifice, self-oblation, self-devotion to the welfare of others, and, no exponent of those doctrines has been more faithful, more consistent, more conspicuous than Father Muller. To restrain and to push back the encroachments of ignorance, poverty, and sin; to do battle with the forces of disease, plague, leprosy and other evils which flesh is heir to—this has been the noble task of his life."

On the Feast of All Saints, 1910, the Very Rev. Joseph Hanselman, Provincial of the Maryland-New York Province of the Society of Jesus, received a letter from India written by Father Muller, the same day, a few hours later, he received a cablegram from India announcing the Father's death.

Muller-Ury, Adolfo, Swiss portrait painter: b Rirolo, Switzerland, 28 March 1864. He received an academic education, and studied art under Deschwanden, at Stans, Switzerland, as a pupil of Cabanel, in Paris, 1881-83, at the Munich Academy, and at Rome, 1883-85. In 1886 he came to America and opened a studio. Among his portraits of celebrated personages are those of Cardinals Hergenrother, Hohenlohe, and Merry del Val, Pope Pius X, and Bishop Kennedy (painted in Rome), President Ruchonnet and Federal Councillor Hammer (painted in Switzerland), Lord and Lady Strathcona and Lord Mount-Stephens (painted in London); and President William McKinley, General U. S. Grant, Senator and Mrs. Chauncey M. Depew, Senator Mark Hanna, J. Pierpont Morgan, and James J. Hill (painted in New York). In 1909 he painted a life size portrait of Emperor William, at Neue Palais, Potsdam.

Multiple Personality. See PERSONALITY.

Municipal Art. Proper decoration of the public school buildings is advocated by the Municipal Art Society, and it is anxious to see the Board of Education create the position of superintendent of decoration of public schools. The work of school decoration, it believes, has been left to long dependent upon private enterprise, considering its far-reaching educational influence upon the whole city. The duty of such a superintendent would be to visit the many schools, to prepare for each a suitable scheme of decorations, and to arrange for carrying on this work systematically until all schools have been provided with this important adjunct to education. The chairman of the so-

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ciety, in a recent report, says: "We all know what a factor art has been in European civilization, and that the church has been a leading contributor and has done more to popularize art and educate the masses than have the many art museums and exhibitions of art works. In this country churches are practically barren of art, and even if they were as richly decorated with masterpieces as are the European churches the message of the masterpieces would never reach the people, since, with the exception of the Catholic Church, they are open but one day in the week. Our art museums are open at impossible hours for the working population, but our public schools, within a stone's throw of every family, open five days in the week." The society holds that the most enduring impressions are made through the eyes, the object lessons are of preeminent pedagogic value. Children may forget the lessons of a textbook, but the illustrations will live with them till they are grown men and women. See also CITY PLANNING.

Municipal Government, Commission Plan of. This form has been adopted by 96 American cities, of which more than one-third lie west of the Mississippi. The legislatures of Kansas, Iowa, North and South Dakota, Minnesota, Wisconsin, and Illinois have passed measures allowing their cities to adopt the plan. Buffalo has started an agitation for it. The legislature has been petitioned for a charter substantially the same as Des Moines, to be submitted to the voters for final approval or disapproval. Kansas City, Missouri, is carrying on a campaign in the same direction. Following in the wake of Galveston, with one or two exceptions, every city of size in Texas, ranging from Dallas and Houston, places of 90,000 population, downward, have adopted the commission plan. Some of them are Fort Worth, Waco, and Austin. All these cities waited until Galveston had tried out the plan for from six to eight years, before adopting it themselves. The idea has spread in Iowa much in the same way. Cedar Rapids, Burlington, Keokuk, and Sioux City have followed the Des Moines plans since 1908. (See BERRYHILL, JAMES G.) These municipalities constitute three-quarters of the city population of the State. The Kansas legislature passed acts allowing cities to adopt a commission form of government in 1907 and 1909. It did so at the urgent recommendation of Governor Stubbs. In that State alone, 90 per cent of the cities of any size have adopted or are working out a plan along the commission line. Some of the cities already governed this way are Kansas City, Kansas, the population of which is 100,000, Wichita, Topeka, and Leavenworth. The idea has spread to Missouri where St. Joseph, with a population of 125,000 has adopted it. Memphis, Tennessee is now governed by the Commission plan, as are five smaller cities in the State. Other cities are Tacoma, in Washington; Berkeley, Riverside, and San Diego, in California; Colorado Springs and Grand Junction, in Colorado; Gloucester and Haverhill, in Massachusetts; the principal cities in North and South Dakota, Idaho, and Oklahoma.

The advantage of the plan in government by commission lies in its simplicity, the responsibility of its officials, and the complete power of public opinion over them.

The Galveston flood was largely responsible for the commission idea. There was so much that had to be done after the disaster to put the city in order that a set of business men petitioned the governor to suspend the local government with its aldermen of the familiar type and old time officials, and replace it temporarily with a commission of five competent men. This was done. The commission built the sea wall to protect the city against further floods, raised the ground level of a large part of the town, got the city government running again at one-third less the annual cost, made a number of improvements, and what was more, reduced the debt and the tax rate. Two years later, the commission was made elective by popular vote, and the appointees of the governor were chosen. The commission plan went into effect in Des Moines in 1907. The first year, it saved \$184,000 in running expenses. Better terms were made for the city in electric light charges, interest on city deposits was obtained for the first time, and the wiping out of certain notorious districts brought about a diminution of crime. Dallas, Texas, began the commission plan in 1907. In the first two years, a deficiency of \$200,000 was wiped out and a credit balance established. Haverhill, Mass., adopted the commission plan in 1909. There was a saving of \$97,900 in running expenses the first year. The city had reached both its tax rate and debt limit when the commission took hold. The legislature was first appealed to for an extension of the tax rate limit, but this is now unnecessary. Gloucester adopted the plan the same year. The commission reduced the city debt \$18,000 the first year. The cost of caring for the roads and streets has been reduced \$6,000 per annum and the work done better. Cedar Rapids, Leavenworth, and all the other cities where the commission plan was adopted, have the same story to tell.

On 1 Jan 1911, 96 cities in 23 States were under the commission form of government. These cities are as follows:

Iowa.—Burlington, Cedar Rapids, Des Moines, Fort Dodge, Keokuk, Marshalltown, Sioux City

Texas.—Anthony, Austin, Beaumont, Corpus Christi, Dallas, Denison, El Paso, Houston, Kennedy, Lyford, Marshall, Marble Falls, Palestine, Port Lavaca, Sherman, San Antonio, Waco, Fort Worth, Galveston, Greenville

West Virginia.—Bluefield, Huntington.

Alabama.—Birmingham.

South Carolina.—Columbia

North Carolina.—Charlotte

Colorado.—Colorado Springs, Grand Junction

Wisconsin.—Eau Claire.

Louisiana.—Shreveport

Kansas.—Abilene, Coffeyville, Cherryville, Caldwell, Emporia, Girard, Marion, Newton, Neodesha, Parsons, Pittsburg, Topeka, Wichita, Wellington, Independence, Iola, Kansas City, Leavenworth, Hutchinson.

Idaho.—Boisé, Lewiston.

South Dakota.—Dell Rapids, Huron, Pierre, Rapid City, Sioux Falls, Vermillion, Yankton.

New Mexico.—Roswell

Washington.—Tacoma (modified.)

Massachusetts.—Gloucester, Haverhill, Lynn, Taunton, Chelsea.

Oklahoma.—Ardmore, Bartlesville, Duncan,

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Enid, Miami, McAlester, Muskogee, Sapulpa, Tulsa, Wagner.

North Dakota.—Bismarck, Mandan, Minot.

Tennessee.—Bristol, Clarksville, Etowah, Memphis, Richmond City.

Mississippi.—Hattiesburg.

Minnesota.—Mankato.

California.—Berkeley, Modesto, Riverside.

Michigan.—Port Huron

Missouri.—St. Joseph

The advocates of the commission form of government are enthusiastic about the showing made by Kansas City, Kan. The close of 1910 found this city established on a cash-paying basis, with a surplus in every one of its funds except the lighting fund, its floating debt almost wiped out, and none of the revenue for 1911 used for the expenses of 1910. This was the city's condition financially at the close of the first nine months of government by commission as announced in Dec. 1910 by C. W. Green, Commissioner of Finance and Revenue. It is the result, he says, of a strict adherence to the provision of the commission law that requires a municipal corporation to "live within its means." It is pointed out that when the commissioners took charge (April, 1910) the funds for 1910 had been used in advance and there was an indebtedness against nearly every fund.

The area of the city under the new rule was 17 square miles, while the area in 1909, under the council jurisdiction, was 10 square miles. The assessed valuation of the enlarged city made in 1910 on which to collect taxes for 1911 expenses is \$58,800,000, against an assessed valuation of \$71,000,000 made in 1909 for 1910; the expenses of the city before the extension of its limits and the rate of taxation in the larger city for all purposes—State, county, city, parks, and schools—is the same under the 1910 levy as under the 1909 levy, \$1.80 on the hundred.

Municipal Ownership. The ownership of a municipality of any business which effects the well-being of the inhabitants. In a city it is necessary to have sufficient water supply, proper lighting, and commodious transit facilities. The comfort, happiness, and prosperity of the citizens is largely increased by the securing of ample breathing spaces, and convenient bathing facilities; sanitary housing, good markets, and docks; as well as sufficient service from certain modern necessities like the telephone. The question of municipal ownership is whether natural monopolies shall be the property of the municipalities themselves or be held by private corporations and individuals through regulated franchises obtained from the city. This is a matter that has become of considerable importance in all civilized countries within recent years. It has strong advocates as well as opponents. The arguments for and against naturally differ with the political systems, and in the United States it may be said that the chief arguments in favor of municipal ownership centre in the fact that corporations which own public franchises are the principal source of corruption in municipal government, through their desire to gain and keep franchises and enlarge their privileges without regard to public welfare. It is also held that city bonds can be floated at a lower rate of interest than those of private corporations, that large profits would not be sought for and that condition of

labor as to wages and hours would be improved. Against municipal ownership are opposed the contentions of inefficient officials and mismanagement through our political spoils system (although civil service appointment would alleviate this condition), of the danger of the industry becoming a public burden through the lowering of rates for the purpose of winning popular favor; and of the probable lack of progressiveness in testing new methods and developing new territory. There is no doubt, however, that the sentiment in favor of municipal ownership is constantly increasing although the experiment has often proved very costly.

Great Britain is the country in which municipal ownership has received its widest application, although some of the continental nations are not now far behind. Nearly 95 per cent of British municipalities carry on one or more of these undertakings. The largest number have municipal markets, then, in order, come waterworks, burial grounds, baths, and work-houses, electric light, and power works, gas works, tramways, harbors and piers, and working-class houses. Recent statistics demonstrate that gas works are the most profitable, and that the baths are operated at the largest loss. Waterworks, tramways, market, and some minor enterprises are profitable; the others show a loss. In the United States, over 75 per cent of municipalities containing more than 8,000 inhabitants own the waterworks. This is the chief extent of municipal ownership in the country. San Francisco, Denver, Omaha, and Kansas City are among the latest municipalities to take up the problem of municipal waterworks. Recently five large places owned gas works and 13 their electric lighting plants. New York and Boston have municipally owned subway roads, but that in New York is leased. New York has a municipal ferry operated at considerable loss. Tramways in Cleveland did not prove profitable. Recreation grounds, baths, etc., are widely prevalent in American cities, but they, of course, are never instituted with any idea of profit. When first advocated municipal ownership became badly confused with socialistic systems, but that conception is now fading from the public mind. Some of the best recent works on this subject are: F. C. Howe, 'The City' (1905); 'The British City,' (1908); Darwin 'Municipal Trade' (1903); Fairie, 'Municipal Administration' (1901); Deming, 'The Government of American Cities' (1909); Munro, 'The Government of European Cities' (1909).

Murdock, Victor, American politician b. Burlingame, Kan., 18 March 1871. After gaining a common school and academical education, he became, in 1894, managing editor of the *Wichita Daily Eagle*, retaining that position, and exercising an increasing influence in Kansas affairs, until 1903, when he was elected to Congress to fill a vacancy. He was reelected to the 59th, 60th, 61st, and 62d congresses, where his activities have classed him as a leading "insurgent."

Murray, Arthur, United States army officer: b. Bowling Green, Pike County, Mo., 29 April 1851. He was graduated from United States Military Academy 15 June 1874; honor graduate No. 1, Artillery School, Fort Monroe, Va.,

1880; instructor in philosophy United States Military Academy, West Point, N. Y., 1881-86; acting judge-advocate, department of the Missouri, 1887-91, acting adjutant-general Department of Dakota, 1891. He was admitted to the bar of the United States Circuit Court of St. Louis, Mo., 1895, professor of military science and tactics, Yale University, 1896-98; accepted commission as captain United States Artillery, 1898, and was acting judge-advocate 1st Army Corps and of Departments of Matanzas and Santa Clara, Cuba, from January to May 1899, and on duty in judge-advocate-general's office June to Aug. 1899. He was appointed colonel of the 43d United States Volunteer Infantry in Aug. 1899, and he commanded the sub-district of Samar and Leyte, Philippine Islands, in 1900. He was made major U. S. A. and assigned to the Artillery Corps, 1 Aug. 1901, and received promotion to lieutenant-colonel, 14 April 1905, and colonel, 1 Oct. 1906, brigadier-general and chief of Artillery United States Army, 1 Oct. 1906, and major-general of the United States Army in Dec. 1910. When he was appointed by Secretary Taft chief of artillery, in 1906, he went before the congress and induced that body to appropriate \$1,300,000 with which sum he constructed 8 mine planters from designs of his own. Two of these little 160-foot boats made a successful voyage around the Horn, and two others made the trip to the Philippines. Besides these he refitted all the tenders from the light house board with necessary paraphernalia for mine planting, making the appliance detachable and storing the same in the several fortifications ready for use at a moment's notice.

Murray, John Gardiner, P. E. bishop coadjutor of Maryland, and 243d in succession in the American episcopate: b. Lonaconing, Maryland, 31 Aug. 1857, of Scotch parents of Presbyterian faith. He was prepared for college at Kingston, Pa., and was graduated at Drew Theological Seminary, Madison, N. J., with the intention of becoming a Methodist minister. His father's death, while at Madison, changed his plans, and he took up the extensive business responsibilities left by his father, and these carried him to Kansas, Colorado, New Mexico, and Alabama. While a resident of the State of Alabama he was confirmed in the faith of the Protestant Episcopal Church by Bishop Wilner on 4 July 1884, and he was licensed as a lay reader on the same day. He continued to work in the church as a layman while attending to his business responsibilities, on 1 Jan. 1893, he was admitted as a deacon by Bishop Jackson in St. Paul's Church, Salina, Ala., and on 16 April 1894, he was admitted to the priesthood by Bishop Wilner. He had charge of the Missionary District of South Alabama, 1894-96, and was rector of the Church of the Advent, Birmingham, Ala., 1896-1903, and rector of the Church of St. Michael and All Angels, Baltimore, Md., 1903-09. He was elected bishop of Mississippi in 1904, and bishop of Kentucky in 1904, both of which offices he declined. In 1909 he was elected bishop coadjutor of Maryland and was consecrated in his own parish church, 29 Sept. 1909. At the time of his consecration he was archdeacon of Baltimore and a member of the standing committee of the diocese of Maryland.

Music. It is fitting to open this subject with the prophetic and glowing statement of Dr. Max Friedlander, the music director of the University of Berlin, who took up his work as Exchange Professor at Harvard University Oct. 1910. Doctor Friedlander is one of Europe's most distinguished authorities on the history of music, which is the topic on which he lectured at Harvard. An observation embodying hopeful views and promising a brilliant future for American music carries no little weight with it. The gist of his statement was as follows:

American music culture is only in its infancy, but the future of no country is richer in promise. In the art of reproduction and interpretation America is already at the pinnacle. We have the work likewise of Dr. Karl Muck and Richard Strauss that the Boston Symphony Orchestra is the best in the world. Those of New York, Chicago, and Pittsburg are not far behind.

American singers, according to Professor Friedlander, rank with the finest. They monopolize stellar positions in many German opera houses, notably in Berlin. Schools of music in America are the largest and best organized. The American appetite for high grade compositions and musicians is insatiable. European artists who return dollar-laden, report that American standards are becoming higher from day to day and that public discrimination is improving correspondingly.

Only in the creative realm does America seem musically backward. This is partially due no doubt to the youth of America and to the fact that her energy has been devoted hitherto primarily to the industrial arts. There seems little doubt, however, that the time will come when America will pursue the finer arts with the same zeal that Carnegie, Rockefeller, and Morgan have devoted to the upbuilding of the economic fabric. Then will America begin to rear a race of composers.

The greatest impediment, in Professor Friedlander's opinion, of the development of a school of American music, is the natural passion for ragtime. As long as coon songs and cakewalks remain so strongly in the atmosphere essential to the development of the composing genius will be lacking.

Europe is prepared to give American composers a welcome reception. It is not true she is prejudiced against them because they are American. Europe is familiar with MacDowell, and her military bands like the Sousa marches.

So much for America's serious advance in the art of music.

However, from the very beginning of the present century the public demand for serious music has been increasing everywhere, so that the musical activity of all the larger communities, both in America and Europe, has assumed almost alarming proportions. Especially orchestral and chamber music has increased notably in the favor of the public, who formerly preferred vocal and chord concerts. A matter that can hardly have escaped notice is the remarkable world-wide success of American artists. The opening of the Manhattan Opera House in New York aggravated that already sore question of high salaries to operatic stars. For years Europeans have been trying to devise means to prevent a wholesale exodus to

America. High salaries have at least brought about one evil, namely: the subordinating of the composer to the singer. Several of the greatest stars appearing America for a few years have sung only those operas within their repertoire and so left many of the best of another language in neglect by reason of disuse.

A remarkable phenomenon of 1908 was the instantaneous enthusiasm aroused in the United States by Debussy's music, especially his opera *Pelléas and Mélisande*. The success of this work here eclipsed its French record even, while Germany's attitude was hypercritical and aloof.

To combat the unstinted salaries paid in the United States thus carrying all talent before them, some Italian and South American impresarios combined their interests and formed a "Trust Teatrale Italo-Argentino." The main object is to secure absolute control of new works, and to attract the best artists by offering them practically an all-year contract as against a four or five month's contract in New York. The trust is able to do this since in South America the summer months constitute the operatic season.

The aggravating question of high salaries was brought in 1909, to a culmination by the rivalry between the Manhattan and Metropolitan companies. By the close of the season this rivalry had become a matter of international importance. André Messager, the director of the Paris Grand Opéra, ascribes the general demoralization of European artists and the abnormal conditions of matters musical, and especially operatic, both in Europe and America to the competition in New York. The "Trust Teatrale Italo-Argentino" of South America to avert just such a situation had failed utterly in its purpose. Not one Italian or South American opera company reported a successful season as a result. In France conditions were nearly as bad; while Germany was only slightly affected, evidently because strictly German operas and artists were unmolessted. Mr. Hammerstein admitted the financial deficit that eventually caused him to abandon the Manhattan Opera at a serious loss.

One result, however, of the keen competition of the world's greatest artists was an array of talent and consequent performances the like of which has never been equalled. The craze for high priced stars, however, reached its zenith. An impetus was given to taste for music, though, which seems to have taken its place as a national art. This is evidenced by the widespread cultivation of music and the increasing number of symphony orchestras throughout the country. During 1907 America was visited by many individual artists. Katherine Goodson, an English pianist performed in a manner that places her in the front rank of pianists. Gertrude Peppercorn, another Englishwoman, proved herself an artist of rank. Next in importance perhaps was that dramatic master of technique, Moritz Rosenthal. From Russia came two of the world's greatest pianists, Lhévinne and Gabrilowitsch and Mieczyslaw Horowitz, a boy of thirteen who will surely take his place among the artists of great style some day. The old favorites, Josef Hofmann, Mark Hambourg, Vladimir de Pachmann, and Teresa Carréno made their usual visit. On his seventh tour Paderewski seemed to make less impression than on any previous visit. Too much

space was given in his repertoire to his own works to have affected his audiences otherwise. Dr. Otto Neitzel appeared both as pianist and lecturer. Among the violinists Kubelik, Fritz Kreisler, and the Russian, Petchnikoff, made the most profound impressions. Only two violoncellists of the first rank were heard, Anton Heking and Elsa Ruegger. Giacomo Puccini visited America and listened to many of his own operas at the Metropolitan Opera House. A novelty was the first appearance of Father Hartmann, the Austrian composer-priest, who conducted his oratorio "St. Peter," with much success in New York.

Among the legion of native artists who attracted no little attention were the pianists, Sigismund Stojowski, Bloomfield-Zeissler, Olga Zamaroff, Augusta Cottlow, Rudolf Ganz, Heinrich Gebhard, and Emil Paur the conductor of the Pittsburgh Orchestra, who appeared many times as solo pianist. Hugo Heerman, the great German violinist, took up his permanent residence in Chicago and appeared with great success in the Middle West. Francis Macmillan returned from his European triumphs and was cordially received. Karl Klein, son of the composer, Bruno Oscar Klein, came forth as a new violinist of unusual power. Maude Powell, Arthur Hartmann, and Jan Van Oordt are among the first rank of violinists that gave pleasure to concert-goers. The most prominent of American cellists are Hans Kronold and Karl Grienauer. Mmes. Schumann-Heink and Nordica appeared with no lessening credit in concert.

The year 1907 was unprecedented in its orchestral activity throughout the country. The new conductor of the Boston Symphony Orchestra, Dr. Karl Muck of Berlin, won immediate favor and admiration. One of his innovations was that of increasing the number of players to 98. He also introduced the new feature of giving concerts without soloists, which met with marked success. The New York Philharmonic Society increased its orchestra to 125 pieces and appeared under its new conductor, Wassily Safonoff. The New York Symphony Society was entirely reorganized on a cooperative basis, under the direction of Walter Damrosch. The Pittsburgh Symphony Orchestra passed through a severe crisis which at one time threatened to disband its organization. Fortunately differences were readjusted, Emil Paur being re-elected as its conductor, and the number of performers augmented from 60 to 80 performers. During the spring of 1907 the orchestra made a successful tour through Canada and part of the United States, in conjunction with the Toronto Choir. After the death of its conductor and founder, Fritz Scheel, the Philadelphia Symphony Orchestra gave its remaining concerts of the season under various conducts—Doctor Neitzel, Mr. Rodemann, and Leandro Companari. During the summer Carl Pohlig, of Stuttgart, was secured as the new permanent conductor. The Theodore Thomas Orchestra of Chicago, under the leadership of Frederick Stock, who in 1905 succeeded Mr. Thomas, completed the delicate task of bringing the work of the orchestra up to more modern demands. The Boston Symphony Orchestra, no longer able to satisfy the great demands for seats, established a new symphony orchestra known as the "Jordan Hall Orchestra," with Wallace Goodrich as conductor.

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Chicago also added a new orchestra—the "Philharmonic Orchestra" under Max Bixby—to the number of already existing musical organizations. After twelve years of highly creditable existence under Frank Van der Stucken, the Cincinnati Symphony Orchestra was disbanded.

Cecile Chaminade without a doubt drew the largest audiences of any foreign artist that visited America in 1908. Mme. Chaminade rendered exclusively her own works and as a pianist showed herself a master in execution. Emil Sauer was heard after an absence of nearly a decade; he too revealed himself as a composer of merit. Josef Hofmann likewise played in the additional rôle of composer thereby showing a lack of true creative genius. Those established favorites Vladimir de Pachmann, Joseph Lhévinne, Ossip Gabrilowitsch, Harold Bauer, Teresa Carrêno, and Katherine Goodson received a warm welcome. Jan Siczek, a new Dutch pianist made a very favorable impression. Among violinists a nineteen year-old Russian boy, Mischa Elman, exhibited wonderful promise. Fritz Kreisler added new laurels to his peerless reputation by his masterly interpretation of the classics. His joint recitals with Josef Hofmann were a decided musical treat. Petchnikoff and Kubelik delighted large audiences. Among vocalists, Mmes Gadske, Nordica, Calve, Schumann-Heink, and Sembrich toured the country in concert. Dr. Ludwig Wullner, the German lieder singer surpassed all other male vocalists in an unbroken series of successes throughout the country; Victor Maurel and David Bispham were scarcely less well received. Among native artists Ernest Schelling, the pianist, attracted especial attention. Mme. Bloomfield-Zeissler, Richard Buhlig and Augusta Cottlow appeared in many concerts. Among the violinists Arthur Hartmann and Albert Spalding met with great success. Karl Klein proved an ornament to Mme Calve's concerts.

America's leading orchestra, the Boston Symphony, began its season with Max Fiedler of Hamburg as conductor. The New York Philharmonic orchestra under the conductorship of Wassily Safonoff, gave an extra, memorial concert devoted to the works of MacDowell. The New York Symphony Society, under Walter Damrosch, devoted six of its concerts to the performance of compositions of Beethoven. In this cycle a newly discovered Trio of the Bonn master for harp, chord, flute and bassoon received its first performance in America. Mr. Damrosch also offered an innovation in this sphere by Duncan with her pantomimic dances. San Franko's concerts of Old Music met with such success that he organized the Bach Choral Society which appeared with the orchestra in a Bach program. The Pittsburgh Symphony Orchestra, Emil Paur, conductor, secured a new and highly efficient concert master in Eduard Tak. He became soloist also and made an excellent impression with Beethoven's concerts for the violin. The Philadelphia Symphony Orchestra, Carl Pohlig conductor, was increased from sixty to eighty pieces. Several new orchestras were established this year. One in Boston, devoting its entire attention to the works of French composers, chose Albert Debauchy for its leader. Another was organized in Wilmington, Del., by A. H. Rode-man. In Seattle, Wash., the first season of eight

concerts of the New Symphony Orchestra under Michael Kigritze led to the commencement of a fund for the erection of a large concert hall.

The tour of Paderewski aroused special interest. While this artist has always exerted a remarkable power of attracting vast audiences, it had become apparent that his ambition to attain distinction as a composer interfered with the amount of practice necessary to maintain himself in the class of the greatest pianists. However his playing during the past year revealed to their fullest extent his extraordinary powers. Among the newcomers the debut of the Spanish boy Pepito Arriola was watched with intense interest. The distinguished Russian composer, Rachmaninoff, revealed himself as an excellent interpreter of his own works. In Yolando Mero we made the acquaintance of a splendid young pianist of wonderful temperament. Germaine Schnitzer, of Vienna, and Germaine Arnaud, of Paris, were both recognized as excellent pianists. Of Gabrilowitsch and Lhévinne, Carrêno and Samaroff, nothing need be said beyond the fact that their art added brilliancy to a brilliant musical season. Among the violinists Jascha Bron was the only newcomer. He is a young man with a reliable technic, and a true musician. Kreisler, Petchnikoff, Elman, Hartmann and Spalding are well established favorites. The Russian cellist, Josef Malkin, impressed his audiences as a most serious artist and consummate master of his instrument. Besides this new artist only Leo Schulz, an established favorite, claimed attention of lovers of the cello. Among the singers an event of the first importance was the celebration by Mme. Sembrich of the 25th anniversary of her appearance on the operatic stage in New York. All the artists of the Metropolitan Opera House participated in a grand farewell performance. Among the new vocalists two at once attracted special attention, the famous Dutch contralto, Tillie Koenen, and the French dramatic soprano, Blanche Arral.

The Philharmonic Society began its 68th season, not only under a new conductor, but practically as a new organization. The original policy of self-government was abandoned. Several wealthy music lovers offered the society a guarantee fund of \$100,000 for three years on the condition that they should be represented on the board of directors, and should have a voice in determining the methods by which the orchestra could be established on a permanent basis. Gustav Mahler was appointed conductor for three years.

The New York Symphony Society, under Walter Damrosch, gave besides its regular concerts devoted to the works of Beethoven, and one of five concerts presenting the principal works of Tschaiakowski. The Boston Symphony Orchestra greatly increased the number of its outside concerts, so that it now appears in more than 100 concerts during the year. Likewise the Philadelphia Symphony Orchestra, the Theodore Thomas Orchestra of Chicago and the Pittsburgh Symphony Orchestra increased the number of concerts on tour. For the Minneapolis Symphony Orchestra a guarantee fund of \$250,000 for five years was raised.

After the dissolution of the Cincinnati Symphony Orchestra, (1907) that city depended on the visits of outside orchestras for its symphonies. During the year (1909) however a new organization bearing the old name was

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formed numbering 70 players under the direction of Leopold Stokovsky. The Dresden Orchestra of 70 performers made a spring tour of the United States without arousing special attention.

There is no doubt that better opera was heard in the season 1909-10 than ever before in America. A greater appetite and an ever increasing interest is responsible in a great measure for this, while the existence of a keen competition between the Metropolitan and Manhattan Opera companies together with an extension of operatic performances in Philadelphia, Boston and Chicago contributed some stimuli. To compare opera in the United States then at the present time with that of a decade ago is to find that we have taken tremendous steps toward advancing music to the position of an established and flourishing art amongst us.

An attempt was made to make a departure by the singing of English Opera in English. On 18 March 1910, Frederick S. Converse's one-act opera, 'The Pipe of Desire' was sung, but met with only a *succes d'estime*. However, a forward step was made towards giving opera in the vernacular. This work by an American composer made up for its realistic and pictorial qualities by a skilful putting together of music, which is poetical and modern in harmonies, and the score contains some expressive and beautiful passages. The presentation revealed careful preparation in its beautiful staging. Riccardo Martin successfully rendered the chief singing rôle, and shared honors with Louise Homer, Clarence Whitehill, Herbert Witherspoon, and Leonora Sparks. The chief fault of the cast was their faulty enunciation, and this was due chiefly to the poor construction of the sentences in the libretto.

The second "American" production was given a hearing at the New Amsterdam Theatre on 8 February. This was 'Sarrona' by Le Grand Howland. This composer's efforts were commendable, but the composition showed a distinct lack of originality and was Italian in construction and material.

The season of 1909-10 opened at the Metropolitan Opera House 15 Nov. 1909, with an artistic performance of Amilcare Ponchielli's 'La Gioconda' with Caruso, Emmy Destinn, Louise Homer, Anna Meitschik (debut) and Amato. On the twenty-fifth of the same month 'Parsifal' (Wagner) was given with a strong cast. On the twenty-seventh one of the finest performances of 'Tristan und Isolde' that has been seen and heard for years was given. In December 'Tannhauser' (Wagner), 'Tosca' (Puccini), 'Orfes and Eurydice' (Gluck).

The Metropolitan Opera numbered among its splendid forces in 1910 such superior artists as Messrs Caruso, Whitehill, Amato, Scotti, Pini-Corsi, and Slezak; and Mmes. Destinn, Homer, Fremstad, Farrar, Galski, Alda and Gluck. Thirty-seven operas were given. Of these 17 were Italian, 12 German, 5 French, 1 American, 1 Bohemian, and 1 Russian. Italian works were heard the greatest number of times, having 72 performances, German came second with 40, while French was given 19 times, Russian 4 times, American twice, and Bohemian received a single hearing. Delibes had seven performances of his ballet 'Coppelia.'

The spectacular opera, 'Germania' (Franchetti), was given in Italian, during January. This

is a lyric drama in a prologue, two acts and an epilogue. Its story is laid in Germany (1806-13), and it was first produced at La Scala, Milan, in 1902. There was a revival of 'Alessandro Stradella' (Flotow) in February, the first time in 23 years. The same month the Shakespearean opera, 'Falstaff' (Verdi) was sung which served to introduce the magnificent tenor, Slezak, as *Falstaff*. This artist likewise scored a marked success several months before in the title part of 'Otello' (Verdi) and later as *Manrico* in 'Il Trovatore'. In March the popular German opera, 'Der Freischütz' (von Weber) was heard. A welcome novelty was heard during the close of the season in 'Pique Dame' (Tchaikowsky). The old-fashioned opera, 'La Sonambula' (Bellini), was sung 23 March.

Mention must also be made of the Russian dancers, Anna Pavlowa and Michael Mordkine who distinguished themselves and drew large audiences wherever they appeared.

Fifty-four operas were given, too, at the New Theatre in conjunction with the Metropolitan Opera management. Twenty-five works were performed. Of French there were 'Werther' (4), 'La Fille de Madame Angot' (3), 'Fra Diavolo' (3), 'L'Attaque du Moulin' (4), 'Manon' (1), 'Alessandro Stradella' (1), the pantomime 'L'Histoire d'un Pierrot' (4), 'The Awakening of Woman' (1), and three performances of Delibes's ballet of 'Coppelia'. Of Italian operas 21 performances were held of 10 works. 'Maestro di Cappella' (3), 'Barber of Seville' (3), 'La Bohème' (3), 'Cavalleria' (3), 'Don Pasquale' (3), 'Pagliacci' (2), and one performance each of 'L'Elisir d'Amore,' 'Madame Butterfly,' 'Tosca,' and 'La Sonambula'. Of German operas there were seven performances of two operas given. 'Czar und Zimmermann' (4), 'The Bartered Bride' (3). The ballet divertissement was also given and a single performance of Converse's 'Pipe of Desire,' and Bayer's 'Wiener Walzer.'

The New Theatre was opened for opera performances on 16 Nov. 1909, with a performance in French of Massenet's 'Werther'. The singers were Farrar, Gluck, Clement and Gilly with a new conductor, Egisto Tango. Altogether the performances at this house were artistically mounted and well sung. Crowded houses were few, however, and the house closed to opera on 1 April, for good with a performance of 'Cavalleria Rusticana'.

The Manhattan Opera House opened with a series of lighter operas 31 Aug. 1909. Mr Zimmermann, its impressario, director and general manager, introduced this season of preliminary opera to the public prices. The opening performance was that of Verdi's 'Aida,' in which the new Spanish tenor, Frederica Carasa made his debut as *Rhadames*; it was continued for nine weeks. While this new venture met with a fair amount of artistic success yet a financial deficit was apparent from the first which soon amounted to \$50,000. The presence of this second company however introduced many new artists to American audiences and did much to tone up the performances of both companies to a high plan of artistic endeavor.

Among the prominent singers of the Manhattan Company, many of whom appeared for the first time, may be mentioned Mmes. Marguerite Sylva, Lala Miranda, Alice Baron, d'Alvarez, Buchene, Taty-Lango, Layas, Walter-

Villa, Cavalieri, Trentini, Carmen-Melis, Ger-ville-Reache, Mazarin, Doria, Mary Garden, and Tetrzzini; and Messrs Jean Duffault, George Lucas, de Bernardo, Henri Scott, Wilhelm Beck, Dalmores, Dufranne, John MacCormack, Orville Harrold and Sammarco.

Mr Hammerstein made a new departure by giving an educational series exclusively of light operas for which he engaged French singers. This experiment did not meet with the success that was expected and indeed which was merited. The light operas performed by his special opera comique company were, 'La Fille de Madame Angot,' 'La Mascotte,' 'Les Dragons de Villars,' and 'The Chimes of Normandy.'

On 8 Nov. 1909 the fourth and last season of grand opera under Oscar Hammerstein's management opened at the Manhattan Opera House with a performance of Massenet's 'Herodiade.' This was one of the great successes of the year. Lina Cavalieri in the role of *Salome* sang well and was at her best in her duet with the Prophet in the dungeon. Renaud took the part of *Herod*, and Dalmores *John the Baptist*.

Many of the Manhattan performances were of such marked novelty and merit that they deserve special mention. On 17 November, 'Sapho' was given for the first time in this country. In fact Massenet was decidedly favored, for soon after his 'Griseldis' was also given its American premiere. For the first time in many years 'La Fille du Regiment' was sung in New York. This opera proved a vehicle to bring Mme. Tetrzzini a deserved success. Soon after 'Tosca' was sung introducing the remarkable beauty, voice and dramatic ability of Mme. Carmen-Melis. In December Mr. Hammerstein made his first attempt to introduce Wagnerian opera in his opera house—in French. But the public received his French-Italian cast and rendering of the great German opera coldly although Zentatello's singing of the title role was splendid. Jan. 1910, saw a sumptuous revival of Saint Saens's 'Samson and Delilah,' which was well rendered and effectively staged. The operatic event of the year, however, occurred 1 February, with the production of Strauss's much heralded music drama, 'Elektra.' It was given on this occasion for the first time anywhere in French and caused a great stir as it had in its performance at Dresden the year previous. Its success was owing mostly to the excellent voice and dramatic ability of Mme. Mazarin who was compelled to remain on the stage and in action for one hour and a half, there being but a single act of that duration. The music is weird and compelling. The orchestra, numbering 113 pieces, was conducted by M. de la Fuente. On 18 February, Orville Harrold made his debut as *Cano* in 'Pagliacci' and was warmly received. This debut deserved especial notice because of the fact that Harrold was singing in vaudeville six months previous where he was "found" by Mr. Hammerstein. There was a revival in March of Debussy's 'Pelleas et Melisande,' in which Mary Garden portrayed the youthful *Melisande* beautifully. The closing innovation of the season was Delibes's 'Lakme' with Tetrzzini in the title role.

Of the 30 operas presented by Mr. Hammerstein in 20 weeks, 18 were French and had 63 performances, 9 Italian with 40 hearings, and 3 German, heard 14 times, all of the last-named being sung in French by French singers. Jules

Massenet's works head the list. It was a great year for this composer. 'Lucia,' on 26 March 1910, with Mme. Tetrzzini and Messrs. MacCormack and Sam-Marco, closed the season.

The new Boston Opera House opened 8 Nov. 1909 with a brilliant performance of Ponchielli's opera 'La Gioconda,' with Lillian Nordica in the title role, Louise Homer as *Laura*, Florencio Constantino as *Enzo* and Meitschik made her first appearance, in Boston as *La Cieca*. Arnoldo Condi directed. The Manhattan Opera Company on 28 March 1910 at the Boston Theatre, gave 'Elektra,' with Mme Mazarin, and 'Lucia' on 29 March. The Metropolitan Opera Company presented 'Aida,' with Caruso at the Boston Opera House, on 28 March, and 'Madame Butterfly' on 29 March.

In Chicago the Swedish baritone, John Forsell, who was unknown in this country until he sang *Tonio* in 'Pagliacci,' during the last of four weeks of opera in that city, sprang into immediate favor. Miss Nielsen, in the second performance of 'La Boheme,' won admiration and Mr Jadowker was recognized as a gifted tenor. Slezak was the biggest drawing card and won the regard and applause of his listeners whenever he appeared. Others who succeeded in impressing the audiences with their art were Fremstad, Clement, Farrar, Caruso, Gadski, Destinn, Scotti, Alten, Amato, and Soomer.

The year of 1910 may be properly termed a quiet one and as times of peace are most favorable to the development of all the arts there need be no cause for regret at this situation. It took just such a year of calm to bring forth 'The Girl of the Golden West,' and 'Koenigskinder,' notable specimens of two different schools of operatic composition.

The former of these two great productions was the most unique and Americanesque opera that has ever been produced in this country. It is a pointed compliment likewise from the pen of such a renowned composer as Puccini to the growth of American taste and appetite in matters of music. The opera not only saw its premiere in America but its first production anywhere, and Signor Puccini was present. Great honor was particularly paid to the American dramatist for Mr. Belasco's play bearing the same name has been preserved in every detail when the rendering in music permits, as has also the scenes and costumes. On 6 Dec. 1910 took place this remarkable production at which seats sold for fabulous prices and were occupied by a celebrated audience.

Puccini's choice of an American subject may not have been entirely without design—aside from the fact that the play contains enough dramatic material to tempt a composer. When Puccini was in New York to hear the first production of 'Madame Butterfly' he was then searching for a suitable subject for a new opera. It was David Belasco who furnished Puccini with his idea for 'Madame Butterfly' and as that opera up to date has been the most successful of Puccini's works it was but natural that the composer gladly offered to read 'The Girl of the Golden West' when it was given to him. Miss Farrar was very anxious to have the prima donna rôle in the new opera, just as she had had it in 'Madame Butterfly' which she considered her personal property, but it seems to have been the composer's idea from the first to give this part of Emmy Destinn. He chose Caruso for the principal male part.

The first two acts of the play, taking place in the bar-room and the Girl's room, have been retained almost intact. The schoolroom scene has been entirely omitted. Much of the last scene has been retained and the opera ends with a chorale of the men to the Girl they have loved so well. This one of the few operas of the serious sort that has a happy ending. At least two of Puccini's scores are in the repertory of practically every singing theatre in the world and the indications are that the newest one will join the others.

In the production of 'Koenigskinder' the operatic public of New York was invited for the second time during one season to witness the first performance of a new opera by one of the foremost European composers, Engelbert Humperdinck. This opera was given on the evening of 28 Dec. 1910, at the Metropolitan Opera House. There was a very large audience and its applause so generous as to indicate emphatically with what great pleasure it received the performance. The composer was present, having been in New York for several weeks watching the preparations for the production of his work. He was called before the curtain repeatedly to acknowledge the enthusiasm his work aroused.

The management of the Metropolitan was generous in its provisions for the new opera and did everything to insure its proper presentation.

The cast was admirably fitted to it. Miss Farrar, Mr. Jadlowker, Mme. Homer, Messrs. Goritz, Reiss and Didur had the chief parts in it; Mr. Hertz conducted, and it was evident that they all had entered into the spirit of the new work with enthusiasm and devotion. The scenic pictures are unusually beautiful and the choral scenes remarkably well developed.

This opera is in fact the composer's refashioning of material that he used in the original form of the work, which was a play with incidental and accompanying music. In this shape 'Koenigskinder' was produced in German in April 1898, in English in Nov. 1902. The play is by a literary lady who uses the pseudonym of Ernest Rosmer, and who is really Frau Elsa Bernstein, of Munich. Some of the music of the original form of the work has been played not a little in orchestral concerts, and is not unfamiliar, and the substance of the opera, especially the themes which the composer has used extensively as "leading motives," was in part contained in the music of the Melodrama.

The first performance of 'Koenigskinder' was in almost every respect admirable and presented Professor Humperdinck's work in its true spirit. It showed at every point the energy and mastery of Mr. Hertz, his understanding of the composer's intentions, which came to him through personal counsel, and his zeal in carrying them out. Miss Farrar made one of her most charming impersonations out of the *Goose Girl*. She is winsome in appearance and she expresses the naïveté of the German maiden in her wistful tenderness. She is the dominating figure of the first act, in which her activity is greatest. Her singing and declamation are excellent, expressive and full of tonal beauty, and dramatic significance. As the *Prince*, Mr. Jadlowker is at his best in singing and music. He is sincere and intelligent in his attempts at his part, but he does not, in truth, make quite all that might be made of it as a robust and

romantically impetuous dramatic figure. Mr. Goritz has a character admirably suited to him in the *Mustrel*, which he acts with humor, spirit, and pleasing spontaneity. The *Witch* that Mme. Homer presents, is comparatively a minor part; but the first act is much the gainer by her cooperation in it, by her admirable singing and characteristic action. Of Messrs. Reiss and Didur, as the two pusillanimous and small-minded Hellabrunners, the broommaker and the woodchopper, only excellent things are to be said. After the first act there were 12 curtain calls. The first three were taken by the singers, who appear in this act. At the fourth call Miss Farrar came out bringing one of the geese with her. At the fifth Humperdinck appeared. At the seventh Alfred Hertz was brought out. After the second act there were again 12 calls. At the fifth of these Signor Gatte-Casezza came out and presented the composer with a silver wreath, the gift of the directors of the house.

There is nothing sensational in the story of 'Koenigskinder,' and is not likely to create public excitement by any qualities of novelty or of daring. But it is a work of great and obvious beauty, of poetic and ideal atmosphere, of a truly musical essence. It requires no effort on the listener's part to understand the composer's thought or the processes by which he has developed it. The composer of 'Koenigskinder' is still the composer of 'Hansel and Gretel,' but the amiable qualities of that work are raised to a far higher power in the newer. 'Koenigskinder' is in no respect a fairy story for children, but one for their elders; an allegory of tragic, even pessimistic import, full of some of the deeper lessons of life, and telling first and foremost, the story of stories, that of people long waiting for a ruler and a leader and finally rejecting him with scorn because he comes without the glory and the splendor of the king.

Music Cure. Various institutions in England, France, and Germany have conducted an elaborate series of experiments in what is known as the "music cure." The central idea of this system is that the individual to be treated in this manner is, in some measure, disharmoniously adjusted to himself and his environment, the "vibration of life" is upset, as it were, and the harmonious strains of music are designed to adjust and harmonize these life-vibrations. There is thus conceived to be a double effect of music upon the patient treated by this method: a physical effect and a mental effect. The physical effect is that just stated—the direct action of rhythmic vibrations upon the human organism, with its equalizing and harmonizing consequences. The mental or psychic effects of the treatment are more or less obvious; the soothing quiet to the mind; the "let-go" which many persons experience when they hear good music; the varying effects of music upon various individuals—all is considered at these establishments, and the treatment regulated according to the condition and needs of the patient. Of course, other measures are administered also, but great reliance is placed upon music. In France especially these institutions have attracted considerable attention; and they are beginning to do so in Germany, England, and the United States. In many of our largest and best sanatoria—such as

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Battle Creek—ample allowance is made for "music-cure" in certain cases.

Musk Rat Raising. Fur farming has been frequently discussed in American newspapers, and some attempts have actually been made with varying success. Until recently the price of muskrat fur has not been sufficiently high to warrant much expenditure to prevent poaching, but the present demand has made muskrat farming a success. There is no great attendant expense, guarding of the preserves and care to prevent depletion of the fur supply by too close trapping being all that is necessary.

The Department of Agriculture has pointed out in a bulletin the possibilities of money making in the protection and breeding of the muskrat or musquash (*fiber zibethicus*). As the muskrat is native to almost every portion of America, the bulletin has wide application.

In many States there are large sections of land well adapted to the raising of muskrats. Marsh land, for example, that is usually considered useless, is recommended for this purpose. Although nearly all the Canadian provinces have a closed season for the muskrat, there are laws protecting it in only 13 of the United States. Many trappers, in their anxiety to distance rivals, begin their trapping as early as October, but as the pelts taken in February are worth nearly twice as much, as those taken in October, fur dealers, in general, deprecate the practice of early trapping, and are endeavoring to secure a reform, one firm in particular having issued a circular asking for cooperation to secure laws protecting all fur-bearing animals from 1 May to 1 November.

The Department of Agriculture recommends a general closed season for muskrats from 15 March to 15 December, or in the more northern States from 1 March to 1 December.

Muskrats are unsuspicious and easily trapped, taking any suitable bait readily, especially in winter and early spring. The best baits are carrots, sweet apples, parsnips, turnips, or pieces of squash. It is doubtful if the scent used by many trappers, such as musk, annis, or rhodium, has any advantage over the natural baits named.

Traps should be set so that the captives will quickly drown. Otherwise the animal is apt to tear loose leaving a foot or a portion of the leg in the trap. Most muskrat hunters use ordinary steel traps. The box trap is favored by some hunters, others use sunken and floating barrels. David E. Lantz, of the Bureau of Biological Survey, gives the following directions for setting traps.

Sink the trap where the water is 2 or 3 inches deep and fasten the chain to a stake or, better still, to a slender pole, reaching into deep water. The pole upon which the ring of the chain is to slide should have a fork at the outer end to prevent the ring from slipping off. Fasten the bait to a stick set in the mud so that the bait is about a foot above the pan of the trap. The animal, in reaching for the bait sets the hind foot upon the pan, and is caught more securely than if taken by the fore foot. It immediately plunges into deep water, sliding the chain along the pole, and soon drowns.

Spearing is deplored on account of the injury to the pelts.

Muskrat skins intended for the market should not be opened along the belly, but "cased." The cutting should begin at the heel and slit up the middle of the hind leg to the tail, around it and down the other leg to the heel in the same way. No other cuts are needed. The skin is then peeled back over the body to the front feet, leaving the fur side inward. Close around nose, ears, and lips cuts are made and the fur is freed from the body.

The skin should not be dried before a fire or in the sun, but in the open air and protected from rain. The fur is cured after the manner of all furs.

Muskrat furs have become popular for almost every purpose for which fur is used. They are used frequently to imitate many of the darker furs with success.

The increase in popularity of muskrat has come within 40 years, but markedly within a space of 2 or 3 years. It was used at first to imitate beaver hats. The London importations show that for the 38 years prior to 1800 the average number of skins sold yearly was less than 75,000. During the 50 succeeding years, the yearly average was 411,000. Since that time the fur has increased in popularity, and in 1909 the total London sales were 3,771,000.

Black muskrat skins bring the trappers the highest price. During the season of 1909 buyers were paying 35 cents each for brown and 45 cents for black ungraded. But for the season of 1910 ungraded brown skins were bringing 65 cents and black skins ungraded 70 cents. Graded skins command a higher average price.

For food the demand is large and increasing. The meat is gamey, and the animals retail for an average price of 10 cents. In certain parts where the demand is heavier the price is double. The flesh is dark red, and most fine-grained and tender. A simple recipe is to soak the animal in cold water, then place in a pot with a few slices of salt pork, adding water sufficient to cover the meat and stew slowly until the water is thickened. Add pepper and salt to taste. All recipes for cooking muskrat require the soaking of the animal for at least an hour in cold salt water. This leaves a slightly gamey flavor, which may be overcome, if objected to, by soaking over night in salt water.

Muskrats are accredited with much damage actually caused by gophers and other animals. Dams, embankments, canals, irrigation ditches are, however, more or less subject to injury from them, and, in Louisiana, where they burrow into embankments flooding or draining the rice fields at the wrong time, they are regarded as pests. They also often feed on the growing crops and break down the plants. A Louisiana law authorizes police juries of the parishes to make any regulation feasible to prevent the destruction of alligators, the absence of which is believed to be the cause of the superabundance of muskrats. Muskrats also frequently invade corn fields and vegetable gardens, destroying the crops and plants.

Muskrats are much like field mice, to which they are related, and to propagate them consideration must be taken of the fact that the animals mate in March and litter first in April, again in June or July, and for a third time in August or September. The average litter contains 6 to 8. They migrate, unless restrained.

Since marsh land is cheap, it can be used

for muskrat farming at a large profit on the investment. Record exists of one muskrat farmer who secured in one season on a 1,300 acre tract of marsh 5,000 muskrats, which he sold for \$2,300. The land was worthless for any other purpose.

Myer, Albert Lee, American military officer b Troy, N. Y., 14 Nov. 1846. At the age of 19, having lived through the Civil War period, when his father died of wounds received in the Wilderness, he joined Company F, 3d Battalion, 11th Infantry, on 26 Oct 1865, and when that battalion was organized into the 29th Infantry he was assigned to Company F of that regiment. He served as sergeant and quartermaster-sergeant until 11 June 1868, when he was discharged to accept the appointment of a second lieutenancy in his regiment. He was transferred to the 11th Infantry on 25 April 1869, when that regiment was formed by the consolidation of the 24th and 29th Regiments of Infantry, with the late Col Alvan C. Gillem in command. From its formation until 1876 the regiment was stationed in Texas, and the various companies took part at different times in the scouts and expeditions against hostile Indians, and also performed escort and

other duties. In the fall of 1876, Lieutenant Myer went with his regiment to the Department of Dakota for field service in connection with the Indian War in that territory and in Montana. He received his first lieutenancy in 1876, and captaincy in 1886, and the following year the regiment was sent to Madison Barracks, where it was stationed until 1891. After leaving this State the regiment went to Arizona, and at the outbreak of the war with Spain the regiment was sent to Oklahoma. The organization did not go to Cuba, but was sent to Porto Rico in July 1898, landing at Guonica on 2 August. Captain Myer served in the campaign in that island, and received his majority on 2 March 1899. He was promoted to lieutenant-colonel of the 27th Infantry, on 22 April 1901. He was transferred to the 11th Infantry on 1 August in that year, and became colonel of the 17th Infantry on 23 Feb 1903, and a month later was transferred to the 11th Infantry. He was appointed a brigadier-general on 23 March 1907, and retired from active service for age on 14 Nov 1910, while commanding the Department of Texas, having served as a private and as a commissioned officer in all the grades from the lowest up.

NAPLES Table Association. The Naples Table Association for Promoting Laboratory Research by Women, in its annual circular, calls attention to the prize of \$1,000 offered periodically by the association for the best thesis written by a woman on a scientific subject, embodying new observations and new conclusions based on an independent laboratory research in biological, chemical, or physical science. The fourth prize will be awarded in April 1911. During the past 12 years 24 women have been appointed by the association and valuable papers have been published as a result of the work done in Naples. The zoological station at Naples was opened by Prof. Anton Dohrn in 1872, for the collection of biological material and for the study of all forms of plant and animal life. Under his personal direction, the station developed into an international institution for scientific research. At the death of Professor Dohrn, 26 Sept. 1909, his son, Dr. Reinhard Dohrn, succeeded him as director. Any government or association which pays \$500 annually is assigned a table for research and is entitled to appoint to it qualified students who are provided by the station with all the materials, apparatus, and assistance, free of cost. One table is used sometimes by four or five research students in the course of the year. The association, which was formed in 1898, to promote scientific research among women, is maintained by annual subscriptions of \$50 each. For the year of 1910-11 the following colleges and associations are contributors: Association of Collegiate Alumnae, Barnard College, Bryn Mawr College, Massachusetts Institute of Technology, Mount Holyoke College, Radcliffe College, Smith College, Vassar College, Wellesley College, Western Reserve University, Women's College in Brown University, Women's Advisory Committee of Johns Hopkins Medical School, and Gorucher College.

Natal. A province of South Africa, comprising an area of 35,371 square miles, with a seaboard of 376 miles. Thirty-five distinct rivers run through it into the Indian Ocean, but not one of them is navigable. The country rises from the sea to the mountains by a series of terraces. The European population has more than trebled since 1879. At the beginning of 1909 it had risen to 91,443. The total population at the same date including Europeans, Indians and Asiatics, and natives, amounted to 1,206,386. Under the provisions of the South Africa Act, passed by the British Parliament in 1909, the Colony of Natal became an original province of the Union of South Africa. The Act provides for an administration, a provincial council, and an executive committee. The council consists of 25 members elected by persons qualified by vote for members of the House of Assembly in the province, voting in the electoral divisions delimited for the purpose by Commissioners appointed under the South Africa Act. The seat of provincial government in Natal is Pietermaritzburg, with an estimated population of 31,230. There are 2 Government high schools, 41 Government primary schools, 2 Government art schools, 5 Government Indian schools, 2 Government schools for colored children, 95 Government-aided schools, and 164 Government-aided farmhouse schools for European children. Of the area of Natal, about 2,624,886 acres have been set apart for native occupation, about 6,200,000 acres have been acquired by grant or purchase from the Crown by Europeans, 112,000 acres by natives, and 13,500 acres by Indians; while about 170,000 acres have been set apart for townships; 1,950,000 acres are in process of alienation, and about 1,127,614 acres remain unalienated from the Crown. The coast region, extending about 15 miles inland, is highly fertile, and has a semi-tropical climate. Maize is the most generally

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cultivated crop throughout the Province, and sugar, coffee, arrowroot, ginger, tobacco, bananas, vegetables, and pepper thrive in the coast region, and the pineapple ripens in the open air. There are 935 miles of railroad open. Zululand, annexed in 1897, comprises about two-thirds of the country formerly under Zulu kings, and is bounded on the south and southwest by the Tugela River and on the southeast by the Indian Ocean. Government is administered by an Administrator, aided by a Provincial Council (elected for three years). There is an executive committee of four members.

Nathan, Ernesto, mayor of Rome, Italy. b. London, Eng., 5 Oct 1845, son of a banker of German origin. His father died when Ernesto was but 14 years old, and he removed with his mother to Pisa, where he continued his studies. Mother and son became disciples of the revolutionary principles of Giuseppe Mazzini, the Italian patriot, and they were forced by his outspoken views to move to Florence, thence to Milan, and to Genoa, where their relations with the revolutionists were discovered, and they were obliged to flee to Switzerland to escape imprisonment. Young Nathan engaged in business in Sardinia, and Genoa, and finally in London, where he remained until 1870, when the Italian army entered Rome, on 20 September, and a provisional government was formed. He then returned to Italy, and became associated with Mazzini in the publication of the *Roma del Popolo*, a newspaper which passed out of existence when Mazzini died. Nathan is the author of several books, chief among which is 'Twenty Years of Italian Life.' In 1907 the extreme parties of Rome, comprising Monarchical Democrats, Radicals, Republicans, and Socialists, joined forces against the Clerico-Moderate parties, which for many years had held the administration of the city. The extremists were successful, and Nathan, who as a Hebrew and a freemason, was most objectionable to the Vatican, was chosen mayor. On the occasion of the 40th anniversary of the taking of Rome, 20 Sept 1910, he made a notable address to the people, which created a stir throughout the world, inspiring a protest from the Pope and a prompt reply from Nathan.

National Association of Mexican War Veterans. See MEXICAN WAR VETERANS, NATIONAL ASSOCIATION OF.

National Banks. See BANKS, NATIONAL.

National Civic Federation. See CIVIC FEDERATION, NATIONAL.

National Geographic Society. During 1910 the membership of the society advanced to 74,000, thus taking rank as the largest scientific organization in the world, its object being the increase and diffusion of geographic knowledge which is disseminated through its official publication, the *National Geographic Magazine*. Lectures were delivered before the society in Washington by Commander Peary, Sir Ernest Shackleton, and Colonel Roosevelt. During 1909-10 the society maintained a large expedition in Alaska, headed by Prof Lawrence Martin of the University of Wisconsin, making a reconnaissance and studying the glaciers of Yakutat Bay, Prince William Sound, and the Copper River, which information was given to the world through the society's magazine. On

14 January the annual dinner of the society was given at the New Willard in Washington, D C, in honor of the United States Army and the discovery of the art of aviation, the guests of honor being the President of the Republic, the German, British, and Mexican Ambassadors, and Mr. Wilbur Wright. A series of 21 lectures were given before the society during the year and the magazine made a volume containing more than 1,100 pictures, including 24 pages of four-color work depicting scenes of native life in China and Corea—a noteworthy educational achievement.

National Grange. The National Grange closed its annual convention of 10 days' duration at Atlantic City on 2 Dec 1910, almost unanimously endorsing the work and plans of the International Institute of Agriculture, which has its headquarters at Rome. The Institute was started by an American, David Lubin of California. In America it has had enthusiastic support and has here encountered strong opposition as well. The opposition has come both from the politicians at Washington and from such Western speculators as have no desire to see a stop put to conditions favorable to wheat cornering and the rest, which the thorough, uniform, and simultaneous crop reports from the whole world, such as the institute's bulletins furnish, are bound to put a stop to. The result of this opposition has been that American representation upon the active force of the Institute at Rome has been by no means equal in influence and ability to that of Germany, Great Britain, and other countries distinctly inferior in rank to the United States in the agricultural field. The farmers naturally feel a sharp discontent with this, and their feelings found expression in the resolution passed by the National Grange, which was as follows: "The National Grange, profoundly interested in the cause of national fraternity and cooperation in the commanding movement for its promotion which is the distinguishing mark and glory of our age, feels peculiar pride and satisfaction in the fact that it is in the field of agriculture that the work of international organization has achieved one of its broadest and most beneficent results. We rejoice that the International Institute of Agriculture, the conception and in a great measure the creation of one of our American fellow citizens and a member of our own order, has now won the confidence and support of almost all the great governments of the world, and become one of the chief servants of all agricultural peoples. Its scientific investigations and invaluable publications promise to put a stop at no distant day to all disastrous and demoralizing speculation in agricultural products. We urge our own government to that conspicuous support of its activities which befit the greatest of agricultural nations; and we urge more generous and practical provision for the distribution of its regular bulletins and various publications among the farmers of the United States. We recommend the appointment by the administration of the National Grange of a special committee to promote the interests of the International Institute in this country, and to make its work of greater and more constant service to our people."

The National Grange has taken occasion to express its warm sympathy and coöperation

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with the movement of the time on behalf of better world organization and closer fraternity of peoples. A report on behalf of the general peace cause, prepared by a committee specially appointed for the purpose in 1908, was adopted at the annual convention at Des Moines in 1909 and published in the proceedings.

National Guard. During the year 1910 there was a net increase in the strength of the National Guard organizations of only 734 men. According to army statistics there were 9,155 officers and 110,505 men. In view of this fact, Col. E. M. Weavers, chief of the division of militia to the chief of staff, recommended in his annual report that some action be taken to remove the hostility towards the militia gen-

erally felt among labor unions. He stated that union men considered national guard organizations as standing bodies of men whose chief purpose was to be called out to put down strikes. That this point of view should prevail, rather than the more patriotic one, Colonel Weavers deplored, but believed that the only way to remove it would be by the establishment of State constabulary, similar to that in Pennsylvania, which could be called out to maintain order under any circumstances. This would relieve the national guard of strike duty and prevent the feeling of hostility.

The militia organizations and their strength at the end of 1910 is given in the following table.

State or Territory	Officers on General Staff	Regimental Officers	Total Commissioned	Total Enlisted	Reserve Militia
Alabama.....	21	190	256	2,300	
Arizona.....	2	562	58	732	40,000
Arkansas.....	50	98	148	1,427	175,000
California.....	64	190	254	2,976	309,546
Colorado.....	19	86	105	1,100	131,000
Connecticut..	25	162	187	2,422	121,070
Delaware.....	7	36	43	416	3,088
District Columbia..	30	81	115	1,664	62,634
Florida.....	25	75	101	1,177	264,335
Georgia.....	3	225	237	2,733	
Hawaii.....	12	35	47	572	8,000
Idaho.....	8	49	57	560	30,000
Illinois.....	23	518	589	6,500	
Indiana.....	8	171	179	2,106	638,560
Iowa.....	43	208	251	3,088	
Kansas.....	31	114	145	1,737	375,533
Kentucky.....	13	145	158	1,851	
Louisiana.....	16	112	127	1,092	4,000
Maine.....	12	122	1,500		
Maryland.....	6	152	158	1,745	
Massachusetts..	97	417	514	6,062	533,264
Michigan.....	20	176	214	3,451	
Minnesota.....	42	166	207	2,598	221,000
Mississippi.....	14	121	135	1,381	32,500
Missouri.....	22	250	272	3,550	125,000
Montana.....	10	52	62	705	35,000
Nebraska.....	11	97	108	1,450	100,000
New Hampshire..	28	70	98	1,121	40,000
New Jersey.....	37	307	344	4,021	576,226
New Mexico.....	11	44	55	711	68,000
New York.....	249	734	983	14,408	1,436,275
North Carolina..	65	176	241	2,174	
North Dakota.....	9	57	66	650	8,000
Ohio.....	28	519	547	6,631	
Oklahoma.....	3	52	66	903	
Oregon.....	21	91	112	1,411	130,000
Pennsylvania.....		580	720	9,387	
Rhode Island.....	4	112	112	1,115	100,000
South Carolina..	31	152	183	1,931	213,274
South Dakota.....	20	87	87	230	70,000
Tennessee.....	12	138	150	1,400	
Texas.....	24	224	248	2,500	600,000
Utah.....	9	34	43	440	25,000
Vermont.....	7	60	67	850	40,500
Virginia.....	27	150	177	2,352	
Washington.....	4	89	93	1,459	
West Virginia.....	2	94	114	1,271	
Wisconsin.....	24	169	192	2,888	438,472
Wyoming.....					

A special order, of interest to the officers of the National Guard, was issued by the War Department at the end of 1910. It contemplates the establishment in the summer 1911 of camps of instruction where civilian officers will receive instruction under regular supervision, to prepare them for the joint maneuvers of the army and National Guard to be held in various parts of the country next summer. These camps will be under the supervision of the generals commanding the territorial divisions of the army, by whom will be selected the regular officers who will be in charge of the instruction of the National Guard officers. The generals are told that care should be exercised in the selection of these officers, as the

entire success of the plan depends upon procuring as instructors competent and qualified officers of the regular army. While the camps are intended primarily for the instruction of company and battalion staff officers, field and regimental staff officers will be invited to attend, with the understanding that during the encampment all questions of rank will be temporarily laid aside. An outline of a course of instruction prepared at the War Department is included in the order, but it is specified that this is given as a guide, to be modified in accordance with the local conditions of the various camps. The course is as follows: (1) instructions on the duties of a soldier, both without and with arms; (2) the prompt forma-

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tion of the company at the sounding of the assembly; (3) the care of the rifle—its essential parts, its care, its cleaning, and its inspection; (4) camp police and sanitation; (5) first aid; (6) rations—selection of components, verification of issues, savings, supervision of kitchen, and inspection of meals, (7) paper work—correspondence, morning reports, duty rosters, sick reports, ration returns, muster and pay rolls, requisitions for supplies, invoices, and receipts, and reports of survey proceedings; (8) exercises in giving commands; (9) instruction in military deportment of officers on duty; (10) extended order drill, (11) instruction in map reading, duties of patrols, advance and rear guards, outposts, duties in infantry attack and infantry defense, and the preparation of field orders. It is suggested that the principles of patrolling be taught by actually organizing the officers into patrols, and that outposts and advance and rear guards be taught by tactical marches. There will probably be between 25 and 30 camps for this preliminary instruction established in the month preceding the joint maneuvers.

National Horse Show. See HORSE SHOW, NATIONAL

Nationalism, New. See NEW NATIONALISM.

National Monetary Commission. See ALDRICH-VREELAND CURRENCY ACT.

National Museum. The United States National Museum is the depository of the national collections. It is a department of the Smithsonian Institution which was established by statute in 1846, under the terms of the will of James Smithson, who bequeathed his fortune in 1826 to the United States for the "increase and diffusion of knowledge among men." The museum is especially rich in the natural history, geology, paleontology, archaeology and ethnology of America, and has unique collections of American history, as well as many series relating to the fine arts and the industrial arts. It is both an educational and a research museum, and issues numerous technical and popular scientific publications. The National Gallery of Arts consists largely of the collections of etchings and engravings of George P. Marsh, the collections of Charles L. Freer, containing numerous paintings and etchings by Whistler, and examples of Chinese and Japanese art; the Harriet Lane Johnston collection, including a number of the greatest English portrait painters, and the collection of William T. Evans, of 100 paintings, representing some of the best work of American artists. The parent Institution has the administrative charge of the Museum, which grew out of its early activities and which is supported by congressional appropriations.

National Society for the Prevention of Cruelty to Children. See CHILDREN, CRUELTY TO, NATIONAL SOCIETY FOR THE PREVENTION OF.

National Society of Arts and Crafts. See ARTS AND CRAFTS, NATIONAL SOCIETY OF.

National Wholesale Grocers' Association. This organization is asking through its committee for the passage by Congress of a bill requiring the branding on food products of their exact net weight or measure. The association which is composed strictly of wholesalers of food products throughout the United States,

was active in securing the passage of the national food and drugs act in 1906. More recently the association has been trying to bring about uniformity in food legislation throughout the country. The association's secretary says that reports from various sections show that consumers are not satisfied with the weight and measure branding clauses of the national food law, which only requires that if the weight or measure is stated on a package the statement shall be a true one. The association's counsel is preparing a model bill making the branding of food products with their true weight and measure mandatory, but the association may give its support to one of several such bills which have already been introduced.

Natural History, American Museum of. The American Museum of Natural History gained many new and important specimens of much interest during the year 1910. After a journey covering more than 38,000 miles in search of specimens, Prof. R. C. Andrews returned to New York in November with skeletons of eight of the largest whales ever taken, together with skeletons of ten splendid specimens of porpoises, which represented the largest collection of the kind ever brought to the United States by a single expedition. Professor Andrews left New York in August 1909 and, through courtesy of the United States Bureau of Fisheries at Washington, was assigned to the United States ship *Albatross*, to do shore collecting among the islands visited by the vessel. After visiting the Philippines, Borneo, Celebes, the Molucca Islands, Formosa, and Loo Choo, at all of which places Professor Andrews collected rare specimens of birds and animals, he proceeded to Japan. That country is to-day known as the home of the whale, and there every possible part is customarily utilized as a food. With the cooperation of the Oriental Whaling Company, the explorer was enabled to make a comparative study of the cetaceans taken in this region. Long trips were made in search of the sea monsters and many exciting experiences attended their capture. In the course of these expeditions Professor Andrews established the record for the longest and most successful scientific whale hunt ever known. Among the skeletons he brought back with him were those of an 80-foot sulphur-bottom whale, a 70-foot fin back, a 46-foot Sei, and 2 killer whales, which were 22 and 26 feet long respectively. Of the porpoises brought back by the professor at least one was new to science, while most of the others were entirely new to the museum. Professor Andrews also secured over 1,000 photographs of rare birds and other inhabitants of the Pacific islands. All of these have been put on exhibition at the museum. In the course of his studies Professor Andrews discovered what he believes to be the explanation of the oil tank in the heads of all sperm whales, the presence of which has always been a mystery to scientists. Twenty barrels or more of pure oil is often found in this tank. The professor accounts for its presence with the theory that it is the provision of nature for feeding the whale when other foods are scarce, his experiments having satisfied him that the oil from this tank is absorbed by the whale's body at such times. This explanation proved of great interest to scientists, and seems to be

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borne out by the fact that when a thin whale is captured this tank is almost invariably nearly devoid of oil, while in the case of a fat whale it is full.

Not long after the reception of the Andrews collection, the result of several months' work on the part of the operating staff of the museum was also placed in exhibition. These specimens were gathered from the ends of the earth and were of great scientific value. One of the most interesting of these was the fossilized skeleton of a marine reptile 11 feet long, which appeared to be half turtle and half serpent. It was classified as a "cryptoclidus" by the scientists in charge of the department of fossilized skeletons. The reptile, which has long been extinct, has long flippers, a broad, compact body, and a short tail, suggesting a huge sea turtle. There the resemblance ceases, however, for the creature had no long shell, while its long, stiff neck, and small, flattened head, with sharp teeth flaring out from the jaws, are quite unlike those of any turtle known to science. This specimen possesses the unusual advantage of having been found in a remarkably complete condition. The bones were not distorted by crushing, so that it was possible to articulate the skeleton in its true proportion and form and mount it in a characteristic pose. Generally the ancient skeletons are found flattened in the rock, so that, while they make a fairly good bas relief, they do not show the real form of whatever species they may represent.

Another task of the museum's which neared completion during the year 1910 was that of filling a large ceremonial Haida canoe, 64½ feet long, with Indian figures, about 40 in all, which should be representative in point of physique, garb, and action of the tribes of the North Pacific Coast. The conception for this was by Director Herman C. Bumpus, and the supervision of the details fell to Lieutenant George T. Emmons. The technical work has been done by Sigurd Neandross, the sculptor. Lieutenant Emmons spent 30 years among the Indians of the Northwest Coast, during which he amassed a vast amount of knowledge relative to old Indian tribes. The ceremonial canoe was made many years ago on the Skeena River, near Port Essington, on the Alaskan Coast, and formed part of the Powell collection obtained by the museum in 1883. The work of filling it with lay figures of Indians was begun in 1908. The figures are so arranged as to represent an ancient ceremonial known as a "potlatch," the time represented being more than a century ago. The canoe is supposed to have reached the surf of the beach, being kept in position there by the paddlers holding water and the bow and stern men operating the poles while ceremonial speeches and dances are rehearsed. The result of the positions chosen for the paddlers and polemen is not only an artistic one, but also gives opportunity for mechanically bracing the boat so that there can be no vibration of the exhibit, the poles being anchored to the floor and the paddles riveted in the cement base supporting the canoe. The "potlatch" was the great giving ceremony when individuals and families impoverished themselves that the dead might be honored, the emblem of the clan exalted, and social standing recognized or increased, and for it the invitations were personally delivered nearly a year in advance of the function itself, while much of a lifetime

was often occupied in the accumulation of material to be given away at the time. The "potlatch" was one of the distinctive features of aboriginal life along the North Pacific Coast from the Straits of Fuca to the vicinity of Mount St. Elias. This canoe exhibit is one of the most popular among all those at the museum.

Another group new to the museum which was put on exhibition late in 1910, was that of a pair of loons, shown in their natural surroundings. The scene is on the New Hampshire shore of Lake Umbagog. One bird is standing erect over her nest and eggs, while the other is represented just emerging from the water and is half hidden by a ridge of moss. The birds are stuffed in a strikingly life-like manner. During 1910, too, the museum received an ethnological collection from Dr. F. D. Aller, of Gatico, Chile. Specimens to the number of 150 are included in this collection. Some of these belong to prehistoric times and many others to the 16th century. Several of the most interesting specimens are articles taken from a woman's grave. One is a basket containing feather plumes, bone charms, and bone awls for basket work, spindles wound with thread, spindle whorls, and a finely netted bag, probably used for carrying cocoa.

Another highly important addition to the museum's collection secured in 1910 was the well-preserved skeleton of a dinosaur, 30 to 40 feet long and 15 to 18 feet in height. This skeleton was discovered in the Palisades, directly opposite New York City, and probably forms the most interesting and notable finding, both from a popular and a scientific standpoint, ever effected east of the Mississippi River. The skeleton is that of a beast which roamed the site whereon New York now stands as many as 10,000,000 years ago. The bones were found lying embedded in a solid sandstone block one foot thick, with a surface measurement 5 by 8 feet, and weighing about 5,000 pounds. The task of removing this block intact presented grave difficulties, but the officials of the museum finally managed it. The dinosaur was of the lizard family, belonging to an order of fossil reptiles found usually in rock of the Mesozoic age, which contains some of the most wonderful land animals that have ever lived. The dinosaur may be said to have been something of a cross between a crocodile and an ostrich on a greatly exaggerated scale. In habits the dinosaur was both terrestrial and amphibious, and the structure of the tail in some cases indicates its use as a swimming organ. Some were of graceful, bird-like action, walking, running, or leaping on their three-toed hind legs. Others were heavy, clumsy beasts, walking or crawling on their solidly built four legs. They grew to larger sizes than did any other animal which, so far as scientific knowledge extends, ever inhabited the earth in any of its periods, some of them being from 60 to 70 feet long, 20 feet high in their natural position, and weighing 20 to 25 tons. Some were carnivorous, others herbivorous, the latter walking chiefly on two feet, with the two forefeet undeveloped, like those of the kangaroo. The great barren chalk lands of the West have been the beds from which the fossils of these pre-historic reptiles have for the most part been taken. Scientists had evidence in the shape of tracks in the rocks that dinosaurs once walked both shores of the Hudson and lived

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on what is to-day Manhattan Island, but before last year not so much as the fragment of a skeleton of one of these creatures had been found in that section. More than usual importance, therefore, is attached to the skeleton of the dinosaur found in 1910 on the cliffs of the Palisades. The latter will be the subject of extensive study on the part of the museum's paleontologists during 1911.

Natural Selection, Theory of. See BIOLOGY.

Nature Cure. Back to nature is the slogan of a new, and constantly increasing cult of health seekers. This movement was started by Father Kneipp, and Priessnitz, but from that time it has spread rapidly until it now has followers in nearly all civilized parts of the world. Its chief underlying principle is the theory that the skin is the main agent in maintaining general good health, hence that it should be freely exposed to sunlight and air. In the pursuance of physical well being through this means the adherents of the nature cure go with so little clothing that it practically amounts to none. Since the beginning Germany has taken a leading part in the no-clothes cure. In nearly all climates there are about six months in a year when any healthy person can go with safety into the open air unclothed. It is of these months that the nature-cure followers chiefly take advantage. In Berlin there is a society composed of some of the leading men of the city who daily during this season take exercise in the open on a large sandy waste just outside the city limits. Being for the most part lovers of music, these men spend a great deal of the time playing wind instruments. Practice upon such instruments has proved most beneficial to them, particularly in combination with their no-clothes cure. A new colony of like nature has been started at Zurich, Switzerland. Here more clothing is worn than at most others because a pleasant mingling of the sexes, in games and social amusements, is one of its features. This has shown itself to be of great psychological and some therapeutical good. By letting the members live constantly in the open and follow all sorts of athletic games, this colony has reported many important cures of disease. The chief American institution of this sort is situated at Bethesda, N. J., where Doctor Lauterwasser, the head, has introduced many innovations which have been the means of making his one of the most successful of all the colonies. It is his belief that patients should come into actual contact with mother earth, and to this end he causes them to partly bury themselves for long periods each day. Following this, Doctor Lauterwasser has his charges indulge in long sun baths. At night they sleep, rolled in blankets, on the bare ground. This sort of treatment has been found highly efficacious in combating tuberculosis, nervous troubles, and diseases of the kidney, liver, stomach, and skin. All these various colonies subsist chiefly on a diet of nuts and fruit. None of them has a single case of sickness to report. The society women of Berlin have come under the sway of the movement, though in a somewhat modified form. They have banded themselves together into what they call the "Body Beautiful Club," meeting daily and going through an elaborate series of calisthenics with their limbs unfettered by clothes. A group of women in Paris have followed his lead, and their success has been

so marked that their club is at present overrun with applications for membership. To the regular gymnasium exercises of their German sisters these French women have added sylvan dances, tending to develop grace and symmetry of movement and pose. Many men and women who are not able to join in the work of the official nature-cure resorts follow in substance their beliefs in their own homes. By divesting the body of clothing, opening wide all the windows of the house, and devoting several hours a day to various exercises, and lying in the sunlight, almost as good an effect may be obtained as if the adherent were actually in the open.

Nature-Study Society, American. The American Nature-Study Society has for its objects: (1) to promote critical investigation of all phases of nature-study (as distinguished from technical science in schools), especially all studies of nature in elementary schools; and (2) to work for the establishment in schools of such nature-study as has been demonstrated valuable and practicable for elementary education. The membership is about 1,150 including practically all the leaders in nature-study and elementary school science in the United States and Canada, together with a very considerable foreign membership scattered over the world. Annual meetings are held in connection with the meeting of the American Association for the Advancement of Science and also with the National Educational Association. The pedagogy of nature-study received the attention of several different committees of the society which are at work upon important problems within this field. The Society publishes the *Nature-Study Review*, which serves both as a clearing house for nature-study pedagogy and as a teaching help in elementary schools.

Navies of the World. Naval authorities disagree as to the relative positions of the United States and the other Powers in their naval strength. In his 1910 *Navy Year Book*, Mr. Pitman Pulsifer gives to the United States second place in vessel strength. Great Britain is first, and the United States, Germany, France, Japan, Russia and Italy follow in the order given. This is the relative strength found by Mr. Pulsifer, both in vessels completed and in another estimate of vessels completed and authorized. In the official table of sea strength prepared by the office of Naval Intelligence of the Navy Department, Germany is put in second place and the United States is third.

In his compilation of vessels completed, building and provided for, Mr. Pulsifer gives this estimate of the number and displacement of all vessels:

	Number	Tons
Great Britain.....	548	2,173,838
United States.....	177	878,152
Germany.....	255	963,845
France.....	448	725,231
Japan.....	181	493,671
Russia.....	211	401,463
Italy.....	171	327,059

Including naval vessels of all classes, in total number Germany is ahead of the United States. It should be stated in favor of the United States that her navy is the youngest navy in the world.

In the large guns, completed, building and provided for, which include 11, 12, 13 and 14

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inch, Germany leads the United States, but nearly half of Germany's armament consists of 11-inch guns, of which the United States has none. The United States has plans provided for twenty 14-inch guns, while Germany has none projected of this calibre.

In armored cruisers, Germany outnumbers the United States both in those built and those building, if the classification of the navy department is followed, but, if the three cruisers, *Charleston*, *Milwaukee* and *St. Louis* are considered as armored cruisers—and they are so reckoned by foreign authorities—then the United States would be ahead in number and displacement of this class of vessels.

At present the navies of three leading powers contain Dreadnought type vessels as follows: England 11, with displacement of 203,100 tons; United States, 4, displacement 72,000; Germany, 4, displacement 72,000.

The year book shows that when vessels now being constructed and those for which funds have been provided are completed, the Dreadnought strength of the three countries will be: England 27, with displacement of 558,000 tons; Germany 17, displacement 357,000; United States 10, displacement 221,650 tons.

The British Admiralty has invited private contractors to bid for the construction of a new warship which is to be greater, faster and more powerful than any vessel built or under construction for the British navy. She will be a considerable advance upon the armored cruiser *Lion*, now being completed at Devonport. Nothing definite regarding her dimensions is yet known, but it is stated that the following table will prove approximately correct.

	New Ship	<i>Lion</i>	Indefatigables
Displacement .	28,000 tons	26,500 tons	16,750 tons
Length .	720 feet	600 feet	555 feet
Beam .	87 feet	86 1-2 feet	80 feet
Horse power .	80,000	70,000	43,000
Speed .	30 knots	28 knots	25 knots
Largest guns .	13 5 inches	13 5 inches	12 inches

Besides ten or twelve 13.5 inch guns, she may carry a secondary battery of the new 10 inch gun with which experiments have recently been carried out. She will be designed to maintain a high rate of speed for a considerable distance without the necessity for recoaling, while the engines, which will be of the turbine type, are to be constructed so that they can be driven either by coal or liquid fuel. This vessel is to be completed for sea within two years from the time the first plate is laid. She will not hold the world's record for size, however, as the largest vessel now building is the Brazilian *Rio de Janeiro*, begun last February at Elswick, Newcastle. This vessel, which will cost about \$14,500,000, will displace 32,000 tons.

An English naval expert, in dealing with the expansion of the German navy, has prepared a table which shows that Germany's expenditure on the construction and armament of new ships has risen from \$6,261,700 in 1896 to nearly \$57,000,000 in 1910. On the other hand, the expenditure of Great Britain has risen from \$43,292,980 in 1896 to \$74,787,150 in the present year. In other words, while the expenditure of Britain in fifteen years has increased roughly by \$30,000,000 that of Germany has increased by \$50,000,000.

M. Briand's last ministerial declaration in

1910 contained a paragraph to the effect that the Government insisted on the necessity of voting as soon as possible the naval programme laid before the Chamber by the late Ministry. This programme proposed the immediate construction of 6 vessels with a displacement of 23,500 tons each and fixed the number of first-class warships of less than twenty years life, that France ought to possess in 1920, at 28. At present France possesses the *Suffren* and 6 vessels of the *Patrie* class, and in eighteen months she should have 6 *Danton*s in service, making 13 in all, leaving 15 more to be built between 1910 and 1920.

Two of these 15 units have been authorized for laying down. They figure in the statement of new ships of 1910 under the names of the *Jean Bart* and the *Courbet*. Their cost is estimated at \$13,000,000 each.

The navy commission of the Chamber has been urging the Government to lay down 2 superdreadnoughts in 1911 and the Navy Department is occupied on plans for these 2 units. The disposition of the turrets is under consideration, whether they shall be axial, as in Great Britain, the United States, Russia and Italy, or along the axis and on the sides, as in France, Germany and Japan, or in échelon, as in Argentina. The Navy Department is understood to be in favor of the axial arrangement, with two guns to each turret.

There are several vessels of large dimensions being built or projected in the United States. The two Argentine ships *Moreno* and *Rivadavia* now under construction in American yards are of 27,940 tons each, a size which will be almost equalled by the United States warships *Texas* and *Nevada*, which were provided for in this year's naval estimates.

The Japanese Government has placed with Messrs Vickers, Sons & Maxim, at Barrow, an order for a battleship cruiser which will be nearly if not quite as big as the projected British cruiser. The displacement of the new Japanese ship is given as between 27,000 and 28,000 tons, but other details are withheld.

Following is a detailed account of the standing of the navies of the world, 1 Jan 1911.

Abyssinia—Has no navy.

Afghanistan.—Has no navy.

Argentine Republic.—The personnel of the navy includes about 480 officers and between 5,000 and 6,000 men, in addition to a corps of coast artillery of 450 men. A naval school, a school of mechanics, a school for artillery, and a school for torpedo practice are maintained. The ships of all kinds are.

	Built	Building or Proposed
Battleships.	3	2
Armored cruisers	4	.
Protected cruisers.	3	.
Armored gunboats.	2	.
Torpedo gunboats.	2	.
Destroyers.	3	12
Torpedo boats	8	12
Submarine	1	.

The principal dockyards are at Buenos Ayres, San Fernando, and Puerto Belgrans. The cost of the new naval program now being carried out, will be about \$35,000,000.

Austria-Hungary.—The personnel of the navy consists of about 815 officers and cadets, 590 mechanicians, engineers and other technical

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officials, and 11,500 men. The navy is largely a coast-defensive force, but is maintained at a state of high efficiency. The new program recently adopted provides for a material increase of the fleet, which, at present, is constituted as follows.

	Built	Building or Proposed
Battleships (modern)	10	37
Armored cruisers	3	12
Protected cruisers	6	11
Torpedo vessels	7	19
Destroyers	12	3
Torpedo boats	59	83
Submarines	6	

The principal dock yard is located at Pola, and there are other small establishments along the Dalmatian coast. The annual expenditures for the navy are about \$13,000,000.

Belgium.—Has no navy with the exception of 1 small ship employed in fishery protection, and a few vessels employed as packets. A few shallow-draught gunboats are maintained in Africa.

Brazil.—The personnel of the Brazilian navy includes about 500 executive officers. The number of men is not given. The fleet is constituted as follows:

	Built	Building or Proposed
Battleships (large)	2	2
Battleships (small)	3	
Protected cruisers	4	
Torpedo gunboats	5	
Destroyers	10	3
Torpedo boats . . . . .	..	4
Submarines . . . . .	..	3
Mine ship . . . . .	..	1

There are naval bases at Rio de Janeiro, Para, and Ladario de Matto Grosso. The principal dockyard is at Rio de Janeiro. Naval expenditures average about \$2,750,000 per annum.

Bulgaria.—The personnel of the navy consists of about 1,145 officers and men. Its fleet consists of 6 large torpedo boats, 2 small torpedo boats, 1 small cruiser, and a few craft of little consequence from the viewpoint of effectiveness.

Chile.—The personnel of the navy consists of about 6,500 officers and men. Its fleet is composed as follows:

	Built	Building or Proposed
Battleships.	1	2
Armored cruisers	2	..
Protected cruisers	4	..
Torpedo gunboats. . . . .	..	..
Destroyers	7	2
Torpedo boats.	5	..
Monitor	1	..
Submarines. . . . .	..	5

Dockyards are located at Valparaiso and Talcahuano.

China.—A complete reorganization of the navy upon modern lines is now being planned. At present the fleet is far from efficient. It consists of: 1 second-class and 3 third-class cruisers, 10 torpedo gunboats, built in Japan, and a miscellaneous assortment of old and obsolete craft. No facts concerning the personnel of the navy are obtainable.

Colombia.—The Colombian navy consists of 5 cruisers, 3 gunboats, and a few craft of miscellaneous kinds.

Costa Rica.—The navy of Costa Rica consists of 1 torpedo boat and 1 gunboat.

Denmark.—The personnel of the navy numbers about 4,000 officers and men. The condition of the fleet in 1910 was: 4 monitors, 3 torpedo gunboats, and 14 torpedo boats. Two battleships and 1 small cruiser are still used, but they would not add materially to the strength of the navy. Two submarines are in process of construction.

Ecuador.—The personnel of the navy comprises about 150 officers and men. Its only effective craft is a steel torpedo boat.

Egypt.—Egypt has no efficient warships, although it maintains a few river gunboats and miscellaneous craft.

France.—An active list of more than 50,000 officers and men and a reserve list almost as great in number provides the French navy with a possible force of more than 100,000 men, of whom about 3,030 are executive officers. Its fleet is classified as follows:

	Built	Building or Projected
Battleships ("A")	16	8
Battleships (coast defence)	9	..
Armored cruisers (large)	13	2
Protected cruisers.	12	..
Protected cruisers (small)	16	..
Protected cruisers (old)	12	..
Torpedo gunboats	14	..
Destroyers.	65	22
Torpedo boats (class 1)	38	3
Torpedo boats (class 2)	279	..
Submarines	58	42

To facilitate administrative operations, the French coast has been divided into 5 maritime arrondissements, the headquarters being at the naval ports of Cherbourg, Brest, Lorient, Rochefort, and Toulon. Shipbuilding establishments are maintained at each. The principal torpedo stations are Dunkirk, Cherbourg, Brest, Lorient, Rochefort, Toulon, Corsica, Bizerta, Oran, Algiers, and Bona. Large dockyards are maintained at each of the naval headquarters. The naval estimate for 1910 was \$68,300,000.

Germany.—The personnel of the navy is about 1,750 officers and 33,500 men in addition to a reserve of about 110,000 men. The condition of the fleet in 1910 was as follows:

	Built	Building or Projected
Battleships.	25	7
Battleships (old)	4	..
Battleships (coast defence)	7	..
Armored cruisers	10	2
Protected cruisers	32	3
Destroyers	93	24
Torpedo boats.	47	..
Submarines	8	..

The ships of the navy are divided between the Baltic and the North Sea stations, the Kaiser Wilhelm Canal, from Kiel to the Elbe, facilitating the passage of the forces from one base to the other. The chief naval establishments are at Kiel, Wilhelmshaven, and Danzig; smaller facilities are offered at Cuxhaven and Sonderburg. The naval expenditures for 1910 were about \$110,000,000.

Great Britain.—The personnel of the navy in 1910 was as follows: officers and men, 10,856; coast guard, 3,276; marines, 17,603; other services, 6,256; total reserves, 46,471. The condition of the fleet was:

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	Built	Building or Proposed
Battleships	48	6
Battleships (old)	13	3
Armored cruisers	16	..
Armored cruisers (small)	16	..
Protected cruisers (class 1)	19	7
Protected cruisers (class 2)	20	..
Protected cruisers (class 3)	15	2
Torpedo gunboats	25	..
Destroyers	190	34
Torpedo boats	110	..
Torpedo ships	1	..
Submarines	65	13

Dockyards are located at Portsmouth, Devonport, Keyham, Chatham, Sheerness, Pembroke, and Maulbowline. The naval estimate for 1910 was \$175,700,000.

Greece—The personnel of the navy numbers about 4,000 officers and men. The condition of the fleet is as follows:

	Built	Building or Proposed
Battleships	3	1
Armored cruisers	..	..
Torpedo boats	19	8
Destroyers	..	..

Nearly all of the torpedo boats are of an obsolete type.

Guatemala—Has no navy.

Hain.—The Republic has a navy consisting of 6 small vessels, which may be ranked as third-class cruisers, 2 sloops and 1 gunboat.

Honduras—Honduras possesses 1 gunboat.

Italy—The personnel of the navy numbers 1,898 officers and 28,500 men. The condition in 1910 was as follows:

	Built	Building or Proposed
Battleships	8	4
Battleships (old)	6	..
Armored cruisers	8	2
Protected cruisers	14	..
Torpedo gunboats	13	..
Destroyers	21	12
Torpedo boats	37	..
Torpedo boats (old)	54	..
Submarines	7	11
Scouts	..	4

Dockyards are located at Spezia, Venica, and Taranto. The principal torpedo stations are at Spezia, Maddalena, Civitavecchia, Gaeta, Messina, Taranto, Genoa, Ancona, and Venice.

Japan—As the result of the lessons learned from the war with Russia, the Japanese navy has been materially increased, and additional vessels are constantly being added. Japan now builds and equips her own war ships, an armor factory having been established at Kure. When on a peace footing the number of officers and men available for service is about 40,000. The condition of the fleet in 1910 was:

	Built	Building or Proposed
Battleships	11	4
Battleships (old)	68	..
Armored cruisers	13	2
Protected cruisers	17	2
Torpedo gunboats	6	..
Destroyers	54	8
Torpedo boats	50	45
Submarines	10	7

The dockyards are maintained at Kure and Yokosuka.

Liberia—One gunboat and 1 unarmed steamer constitute the naval force of Liberia.

Mexico—The Mexican navy is small, the personnel numbering but 198 officers and 965

men. The fleet consists of 2 steel cruisers, 2 despatch vessels, 2 unarmored gun vessels, and 4 gunboats. Six cruisers are projected.

Montenegro—Has no navy.

Netherlands, (The)—The personnel of the navy in 1910 consisted of about 575 officers and 8,000 men. In addition to the regular force, the government maintains a marine infantry consisting of 50 officers and about 2,250 men. The condition of the fleet was as follows:

	Built	Building or Proposed
Battleships	8	1
Cruisers	7	..
Protected gunboats	1	..
Torpedo boats	50	..
Gunboats	26	..
Monitors	1	..
Submarines	1	..

Dockyards are located at Helder, Hellevoetslijs, Amsterdam, and Rotterdam.

Nicaragua—The navy consists of 8 small steamboats, 3 on the lake, 1 on the Atlantic, and 4 on the Pacific.

Norway—The personnel of the navy numbers about 135 officers and 1,000 men. The fleet in 1910 included 4 protected cruisers, 3 gunboats, 3 destroyers, 2 coast-service monitors, 29 torpedo boats, and 1 submarine. Another protected cruiser is projected. The government maintains two dockyards, one at Horton, the other at Christiansand.

Panama—Has no navy.

Paraguay—One small despatch vessel and 2 steamers.

Persia—The navy consists of 8 small vessels, now employed in the interest of the customs department.

Peru—The navy consists of 2 small but modern cruisers, 1 old cruiser now being rearmed, and 1 despatch boat.

Portugal—Prior to the revolution in Portugal, the personnel of the navy numbered 425 officers and 5,690 men. At that time the fleet consisted of 1 armored cruiser, 5 protected cruisers, 19 gunboats, 1 corvette, 1 torpedo gunboat, 10 torpedo boats, 2 destroyers, 16 river gunboats, 1 scout, and 2 submarines. The naval dockyard is at Lisbon.

Rumania—The Rumanian navy is steadily expanding. During 1907, 12 vessels for the use of the naval police were launched, in 1909, a floating dock was purchased; several gunboats are now being constructed, and 2 armored cruisers are proposed. At present the navy consists of 1 protected cruiser, 7 gunboats, 6 coast-defence vessels, 8 torpedo boats, and 1 despatch boat. There is a marine arsenal at Galatz.

Russia—The number of officers and men in the navy is about 60,000. The condition of the fleet in 1910 was as follows:

	Built	Building or Proposed
Battleships	10	4
Battleships (old)	3	..
Battleships (coast defence)	1	..
Armored cruisers	6	2
Protected cruisers	8	..
Torpedo gunboats	7	..
Destroyers	97	5
Torpedo boats	98	..
Submarines	23	4

There are dockyards at Kronstadt, Libau, and Sevastopol. The latest estimate of naval

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expenditures placed the amount at about \$47,500,000 per annum.

Salvador—One small cruiser, now on custom house duty.

San Domingo—One gunboat and 4 small cutters, the latter used in the customs service.

Servia—One small steamer

Siam—One destroyer and 3 torpedo boats, purchased from Japan in 1908, and 22 miscellaneous vessels of small size and little fighting value.

Spain—Spain is adopting a new naval program, and proposes to put her navy upon a more modern basis. At present its personnel numbers about 16,750 men of all ranks, including a force of 9,000 conscript marines. The condition of the fleet in 1910 was:

	Built	Building or Proposed
Battleships	1	1
Armored cruisers	2	1
Protected cruisers (large)	1	1
Protected cruisers (small)	5	..
Destroyers	5	..
Torpedo boats	6	..

Dockyards are located at Cadiz, Cartagena, and Bilbao.

Sweden—A parliamentary committee is now considering the questions of a new ship-building program, the completion of fortifications, the establishment of new naval stations, and others of vital importance to the navy. The personnel of the navy numbers about 290 officers and about 7,000 men. The fleet, in 1910, consisted of 1 armored cruiser, 12 coast-defence battleships, 5 torpedo gunboats, 8 destroyers, 55 torpedo boats, 10 coast service monitors, and several submarines. One armored cruiser is now in process of construction. Dockyards are maintained at Stockholm and Karlsrona.

Switzerland—Has no navy.

Turkey—The personnel of the navy numbers 915 officers and 39,000 men, including about 9,000 marines. The navy is now undergoing the process of reorganization, but, at present, it is far from effective. In 1910 the condition of the fleet was:

	Total	Effective	Building
Battleships....	10	5	..
Cruisers	2	5	..
Torpedo gunboats....	4	2	..
Destroyers	5	5	..
Torpedo boats.....	38	15	..
Gunboats.....	..	..	..

United States—See UNITED STATES NAVY.

Uruguay—Two gunboats, 1 despatch boat, and other small craft.

Venezuela—Three gunboats and 1 torpedo boat.

Navy, United States. See UNITED STATES NAVY.

Nebraska. One of the States of the West North Central division having a population according to the 1910 census of 1,192,214, a gain of 11.8 per cent over 1900. The population per square mile is 15.5 per cent. The State has an area of 77,530 square miles of which 702 is water. The capital is Lincoln, population, 43,973.

Agriculture.—The acreage production and value of the important farm crops in 1910 were as follows: Corn, 206,400,000 bushels, acreage, 8,000,000, value, \$74,304,000; winter wheat, 34,650,000 bushels, acreage, 2,100,000, value, \$27,720,000; spring wheat, 4,865,000 bushels, acreage,

350,000, value, \$3,892,000; oats, 74,200,000 bushels, acreage, 2,650,000, value, \$20,776,000; barley, 2,498,000 bushels, acreage, 135,000, value, \$1,124,000; rye, 1,200,000 bushels, acreage, 75,000, value, \$720,000; buckwheat, 20,000 bushels, acreage, 1,000, value, \$18,000; flaxseed, 80,000 bushels, acreage, 10,000, value, \$180,000; potatoes, 6,600,000 bushels, acreage, 110,000, value, \$5,544,000; hay, production, 1,500,000 tons, acreage 1,500,000, value, \$13,350,000. The farm animals of the State on 1 Jan 1910 were as follows: horses, 1,045,500, value, \$112,860,000, mules, 72,000, value, \$8,568,000; milch cows, 879,000, value, \$30,765,000; other cattle, 3,040,000, value, \$66,576,000; sheep, 393,000, value, \$1,729,000; sheep of shearing age, 275,000; average weight of fleece, 65 pounds; per cent of shrinkage, 62; wool, washed and unwashed, 1,787,500; wool scoured, 677,350 pounds; swine, 1,942,000, value, \$19,420,000.

Mining and Manufacturing.—Nebraska has no mines. There are some quarries for limestone and sandstone, the output of which for the last year in which figures were available being \$338,070. There were also brick and tiles produced, valued at \$946,516. The total mineral output was \$1,452,388. The manufacturing establishments numbered 2,492, a gain of 37 per cent in five years, the capital \$84,015,000, a gain of 5 per cent; the cost of materials, \$151,671,000, a gain of 22 per cent; the salaries and wages \$19,432,000, a gain of 38 per cent; the value of the products \$198,669,000, a gain of 28 per cent; the value added by manufacture (products less cost of materials), \$46,998,000, a gain of 52 per cent. The number of salaried officers and clerks was 5,105, and the average number of wage earners employed during the year 24,323. Omaha is the largest manufacturing city of the State. The slaughtering is the main State industry. The capital invested was \$20,592,542, the cost of material, \$61,205,612, the output, \$69,243,468, and the number employed 5,585,000. Another important industry was flour and grist, the capital employed being \$6,496,878, and the output, \$12,190,393. Other large industries are railway shops, brewing, soap, and candle making, smelting, sugar, and printing.

Government.—The Governor of the State is Chester H. Aldrich, Republican, salary, \$2,500; term of office two years, expiring Jan. 1913. The Lieutenant-Governor is M. R. Hopewell; Secretary of State, Addison Wait; Treasurer, W. A. George; Auditor, Silas A. Barton; Attorney-General, Grant G. Martin. The composition of the Legislature is as follows: Senate—Republicans, 14; Democrats, 19. House—Republicans, 46; Democrats, 54. The United States Senators are Norris Brown, Republican, and Gilbert M. Hitchcock, Democrat. The members of the House of Representatives are, John A. Maguire, C. O. Lobeck, James C. Latta, Democrats, and Charles H. Sloan, George W. Norris, and Moses P. Kinkaid, Republicans.

Finance.—The debt of Nebraska amounts to \$2,005,001 and the debts of the cities, counties, and minor civil divisions amount to \$20,410,040. The 20 per cent valuation of the real property is \$261,936,073 and the personal \$150,202,534, and the tax rate \$5 per \$1,000. The State has 194 National banks, with 26,348 depositors, and \$10,058,208.57 deposits; 520 State banks, with 24,479 depositors, and \$10,900,758.50

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deposits. There are six private banks and 11 savings banks with 16,846 depositors and \$2,618,239.87 deposits. The last available figures showed the receipt of funds by the State, for the fiscal year ending 30 Nov. 1910, of \$10,960,919.50, and disbursements of \$10,744,066.34. There is no bonded debt.

Religion and Education.—The leading religious denominations of the State are as follows: Roman Catholics, 49,030 male and 51,733 female; Presbyterians, 8,751 male and 13,888 female; Lutherans, 27,146 male and 28,204 female; Methodists, 23,036 male and 37,739 female. The pupils enrolled in the public schools number 280,581, and the average daily attendance 191,152. There are 10,352 teachers. The universities, colleges and technical schools are nine in number, having 334 male, and 114 female professors and instructors, and 3,603 male and 2,811 female students. The total tuition fees amounted to \$149,716, and the total income from this source, productive and government funds, was \$922,215. The value of the buildings was \$1,798,687. The standard for private and denominational schools has been raised by permitting the granting of certificates and increasing the minimum entrance requirements of State normal schools to two years of high school education. The term in free high school has been fixed at four years for every child completing the elementary work. The district pays the tuition in the four-year high school.

Charities and Corrections.—The State has two homes for soldiers and sailors, one for feeble-minded, two for incorrigible boys and girls, three asylums for the insane, and institutions for the deaf, blind and homeless. These are exclusive of other institutions supported by private corporations and religious bodies. The paupers are under the jurisdiction of the justices of peace in the counties and the district overseers. No pauper can seek relief until he has lived 30 days in the county; parents, grandparents, children, grandchildren, and brothers and sisters are liable for support. There is a penalty of \$100 for bringing a pauper into the county.

Legislation.—The Legislature meets biennially and its sessions are limited to 90 days. Its last session was in 1909 at which certain changes in the State railway law regarding the details of administration were passed. The issuance of stocks, bonds and notes for a greater period than 12 months was forbidden without the consent of the railway commission, a two-cent fare law, a maximum freight law were passed, both of which are at present being tested in the courts. The legislature also passed acts for a compulsory system of guarantee of bank deposits imposing an occupation tax upon corporations providing for "A more certain selection of the people's choice for United States Senators," a pure food law regulating hotels as to sanitation, prohibiting sale of liquor on Sundays and between certain hours on week days, care of indigent consumptives, penalizing railroads for delay in settling claims, provision for the physical valuation of railroad properties, the abolition of secret fraternities in public schools, and a uniform warehouse receipt bill.

History, 1910.—During the latter part of 1910 nine ranchmen of western Nebraska were indicted for driving at the point of their guns

certain homesteaders who settled on sections of semi-arid lands under the Kinkaid Homestead Law. The interior department claims that the indictments cover one of the most remarkable attempts at land grabbing ever brought to its attention. The Democratic victory at the election of Nov. 1910 insured a Democratic senator from the State.

Necrology, 1906.

	Date of Death
Acheson, Marcus W., Am justice	June 21
Adams, Henry Cullen, Am statesman	July 9
Adams, Robert J., Am statesman	June 1
Albrecht, Prince, Eng Regent	Sept 13
Almodovar, Duke of, Sp Min For. Aff.	June 23
Alvey, Richard H., Am jurist	Sept 14
Ambler, Jacob A., Am statesman	Sept 21
Anthony, Susan Brownell, suffragist	March 13
Appleton, Nathan, Am author	Aug 25
Arthur, Joseph, Am playwright	Feb 20
Asserson, Peter Christian, Am naval off	Dec 7
Atherton, George W., Am Pres Penn State Col.	July 24
Bailey, James A., Am circus prop.	April 11
Baird, Henry Martyn, Am edu	Nov 11
Baring-Gould, Sabine, Eng author	June 4
Barret, George Carter, Am jurist	June 7
Bayliss, Sir Wyke, Eng artist	April 6
Beit, Alfred, Eng Financ	July 16
Bell, William H., Am Army off.	Oct 18
Bennett, Johnstone, Am actress	April 14
Bispham, George Tucker, Am lawyer-author	July 28
Blanco, Ramon, Sp sol-dip	April 4
Boyd, James E., Am statesman	April 30
Breslin, James H., Am hotel prop	March 31
Breton, Jules, Fr painter	July 5
Brown, Arthur, Am statesman	Dec 12
Brown, William L., Am jour	Dec 13
Brunetiere, Ferdinand, Fr author	Dec 3
Burden, James Abercrombie, Am banker	Sept 23
Burnett, Swan M., author-phys.	Jan 18
Butler, Robert Gordon, Am jour	Sept 24
Cassatt, A. J., Am R R pres	Dec 28
Cannon, Leland B., Am banker	Nov 3
Cassier, Louis F., Eng pub	June 30
Castor, George A., Am statesman	Feb 19
Cayran, Georgia, Am actress	Nov 19
Chichester, Sir Edward, Eng naval off	Sept 15
Christian IX., King of Denmark	Jan 29
Church, Francis Pharellus, Am author	April 11
Cleveland, W. N., Am clergyman	Jan 15
Craige, Pearl Mary, Eng author	Aug 13
Cropper, John, Am sol	Dec 7
Curie, Pierre, Fr scien	April 19
Curzon, Lady, Eng Nob	July 18
Damon, Esther Sumner, Am Rev. survivor	Nov 11
Danforth, Elliot, Am pub off	Jan 7
Davis, Vanna Howell, Am wd. Jeff Davis.	Oct 16
Davitt, Michael, Ir, agitator	May 31
Delany, John B., Am bishop	July 11
Doremus, Robert Ogden, Am scien	March 22
Dresser, Paul, Am composer	Jan 30
Dunbar, Paul Lawrence, Am poet	Feb 9
Dwight, William, Am edu	Aug 29
Dyer, Elsha, Am statesman	Nov 29
Eaton, John, Am edu	Feb 9
Erwin, Robert G., Am cor pres	Jan 13
Field, Marshall, Am merchant	Jan 17
Forsyth, James W., Am army off	Oct 24
Garcelon, Alonzo, Am ex-gov Me.	Dec 8
Garlin, Manuel, Singing master	July 2
Gary, Joseph E., Am jurist	Oct 31
Gatacre, Sir William F., Eng army off	March 6
Gilchrist, Charles A., Am army off	Jan 22
Glidden, Joseph F., Am inventor	Oct 9
Goodale, Henry S., Am agriculturist	July 25
Gorman, Arthur Pue, Am statesman	June 4
Grenfell, Sir Harry, Eng Nav off	Feb 20
Harper, William Rainey, Am edu	Jan 10
Harris, Thomas M., Am army off	Sept 3
Harrison, Lynde, Am jurist	June 8
Hartmann, Karl von, Ger metaphy	June 3
Hendu, George W., Am ex-gov Vt.	Dec 6
Henderson, David B., Am statesman	Feb 25
Herring, George, Eng philanthropist	Nov 2
Hitt, Robert Roberts, Am statesman	Sept. 19
Hoar, Rockwood, Am statesman	Nov 1
Hodge, Edward B., Am edu-theo	Sept 19
Hogg, James Stephen, Am ex-gov Tex.	March 3
Holyrake, George Jacob, Eng author	Jan 22
Hoppin, James Mason, Am edu	Nov 15
Hughes, Aaron K., Am naval off	May 5
Huntington, David, Am painter	April 18
Ibsen, Henrik, Nor poet-dram	May 28
Irving, John Treat, Am author-lawy.	Feb. 27
Jacobi, Mary Putman, Am. phy.	June 11

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	Date of Death		Date of Death
Jewett, Daniel T., Am statesman..	Oct 7	Agassiz, Elizabeth Cabot, Am edu-writer	June 27
Johnson, Eastman, Am painter	April 6	Aldrich, Thomas Bailey, Am poet-ed-novel	March 19
Jones, Sam, Am evangelist	Oct 15	Alexandra, Mary, Wilhelmina, Ger princess	Jan 9
Ketcham, John H., Am statesman	Nov 3	Alger, Russell Alexander, Am pol-sol	Jan 24
Ketcham, George A., Am phy	May 29	Anikhanoff, General, Rus sol	July 7
Kodama, Baron Gentaro, Jap sol	July 22	Alison, Sir Archibald, Eng sol	Feb 5
Landgell, Christopher Columbus, Am edu	July 6	Allendale, Wentworth Blackett Beaumont, Eng statesman	Feb 13
Langley, Samuel Pierpont, Am naturalist	Feb 27	Andrews, Edward Gayer, Am Meth-Epsc bish	Dec 31
Lapponi, Giuseppe, It phy	Dec 7	Armstrong, Sir George Carlyon Hughes, Eng sol	April 20
Lawson, Sir Wilfred Eng statesman	July 1	Atwater, William Ohn, Am chem	Sept 22
Lister, Samuel Cunliffe, Eng invent	Feb 2	Baker, Sir Benjamin, Eng civ eng	May 19
Lockwood, Daniel Newton, Am lawy-statesman	June 1	Benedict, George Greenville, Am ed-author	April 8
Logan, Walter Seth, Am lawy	July 19	Beaudouin, Otto, Ger archaeologist	Jan 2
Lowell, Caroline, Am actress	Oct 13	Bentzen, Edward Hallaran, Ger surg	June 3
McCabe, Charles C., Am Meth-Epsc bish	Dec 19	Bentzen, Th (Marie Therese Blanc) Fr author	Feb 7
McCall, John A., Am cor pres	Feb 18	Berthelot, Pierre Eugene Marcelin, Fr chem	March 18
McClellan, Thomas N., Am jurst	Feb 10	Brezold, Wilhelm von, Ger meteorol	Feb 17
McDonald, William H., Am actor	March 27	Ballot, Jean Baptiste, Fr Min of War	June 1
McCliver, Charles D., Am edu	Sept 17	Ballson, Sir Alfred, Eng pol leader	July 9
McMahon, Martin T., Am justice	April 21	Blair, Andrew George, Can pub off	Jan 25
McMichael, Morton, Am pub off	April 17	Blind, Karl, Ger author-agitator	May 31
McNeill, George E., Am lab leader	May 19	Botbacher, Karl Heinrich von, Ger statesman	March 6
Mack, Frank, Am journ	Oct 24	Brandis, Sir Dietrich, Ger-Eng forester	May 28
Malone, John, Am actor	Jan 15	Brandran, Kosma, Eng singer	Feb 28
Marshall, William Edgar, Am painter	Aug 29	Brull, Ignaz, Austrian comp	Sept 17
Martin, Luis, It Rom Cath S J gen	April 18	Buchan, Alexander, Sc meteorol	May 13
Meehan, Patrick J., Ir ed	April 20	Bugge, Elsen Sophus, Nor edu	July 8
Miller, Edward Howe, Am edu	Nov 8	Bullock, Rufus Brown, Am pol	April 27
Mitre, Bartolome, Argentine Republic ex-pres	Jan 19	Caffery, Donelson, Am statesman	Feb 15
Morris, Benjamin Wistar, Am bish	April 8	Carducci, Giosue, It poet	March 12
Morrison, Lewis, Am actor	Aug 20	Casimir-Ferner, Jean Paul, ex-pres. Fr	Dec 1
Moses, Franklin J., Am ex-gov of S C	Dec 11	Cauldwell, William, Am journ	Dec 1
Neill, Henry M., Am chem	Sept 12	Chamberlain, Daniel H., Am ex-gov. S C	April 13
Nevin, Robert J., Am clerg	Sept 20	Chartran, Theobald, Fr painter	July 16
New, John C., Am ed	June 4	Clay, Cecil, Am pub off	Sept 23
Nicholson, Isaac Lea, Episc bish	Oct 29	Clementine, Princess of Saxe-Coburg and Gotha	Feb 16
O'Day, Daniel, Am Financ	Sept 13	Coleman, Leighton, Am Episc bish	Dec 14
Oelrichs, Hermann, Ger merchant	Sept 1	Colyar, Arthur St. Claire, Am jurst	Dec 13
Otto, Archduke, Austrian dip	Nov 1	Conger, Edwin H., Am dip	May 17
Owen, William F., Am actor	May 4	Conway, Moncure D., Am author	Nov 16
Page, Charles, Am army off	Sept 14	Coutts-Burdett, Baroness of, Eng nob	Dec 30
Paine, John Knowles, Musical director	April 25	Cruvell, Sophia, It, singer	Nov 6
Palmer, John Williamson, Am ed-poet	Feb 19	Cunneen, John, Am pub off	Feb 21
Parkhurst, John G., Am Army off	May 6	Cutler, Charles Frederick, Am cor pres	May 28
Patterson, George R., Am statesman	March 21	Davis, James (Owen Hall) Am dram	April 10
Pattison, John M., Am gov of Ohio	June 18	De Bourbon, Robert Charles Louis Marie, It dip	Nov 17
Peacock, John, D. D., Am clerg	June 18	Delamateur, George Wallace, Am pol leader	Aug 7
Peel, Sir Frederick, Eng statesman	June 9	De Peyster, John Watts, Am sol-hist	May 5
Peirce, James M., Am edu	March 21	De Ros, Baron, Eng sol	April 30
Pelligrini, Carlos, Argentine Republic ex-pres	July 17	Dowie, John Alexander, Am preacher	March 9
Penfield, Samuel Lewis, Am mineralog	Aug 12	Dundy, Elmer Sapiro, Am financ	Feb 5
Poor, George H., Am invent	Sept 28	Dunmore, Earl of, Eng, Theo	Aug 26
Quintana, Manuel, Argentine Republic pres	March 11	Duryea, William, Am manuf	April 26
Reed, Edward James, Eng Naval design	Nov 30	Dwight, Melatiah Everett, Am geanol	Sept 14
Rhoades, John Harson, Am banker	Dec 8	Eckels, James H., Am banker	April 14
Rice, Edmund, Am army off	July 20	Estell, John Holbrook, Am journ	Nov 9
Richtshofen, Baron von, Ger Sec For Aff	Jan 17	Farquhar, Norman Van Helden, Am naval off	July 3
Riker, William B., Am druggist	Feb 22	Field, Henry Martyn, Am clerg-author	Jan 26
Ristori, Adelaide, It actress	Oct 9	Finch, Francis Miles, Am author-jurst	July 31
Roosevelt, Robert B., Am lawy-statesman	June 14	Fischer, Ernst Kuno, Ger phil	July 4
Rosewater, Edward, Am ed	Aug 31	Fitzgerald, James Newberry, Am Meth-Epsc bish	April 4
Rousse, Edward, Fr lawy	Aug 1	Frederick of Baden, Ger Duke	Sept 28
Roustan, Theodore, Fr Por min	Aug 8	Furlong, Charles E., Am sol	Sept 25
Rucker, Louis Henry, Am army off	July 1	Goschen, George Joachim, Eng pub off	Feb 7
Russell, Israel C., Am edu	May 9	Gougar, Helen M., Am author	June 6
Rutland, Duke of, Eng Nob	Aug 4	Granbery, John C., Am Meth-Epsc bish	April 1
Sage, Russell, Am financ	July 21	Grau, Maurice, Fr singer	March 14
Schofield, John M., Am Army off	March 4	Grieg, Edward Hagemp, Nor comp	Sept 4
Schurz, Carl, Ger-Am statesman-author	May 14	Grow, Glusha H., Am statesman	March 31
Seddon, Richard John, Eng Pr-min	June 10	Guggenheimer, Randolph, Am lawy	Sept 12
Seymour, George F., Am P. E bish	Dec 8	Gunter, Archibald Clavering, Am author-dram	Feb 23
Shafter, William Rufus, Am army off	Nov 12	Hall, Asaph, Am astron	Nov 22
Shaler, Nathaniel S., Am geolog	April 10	Haeselbarth, William G., Am clerg	Dec 13
Shayne, Christopher C., Am merchant	Feb 21	Harkness, Albert, Am edu	May 27
Shipman, Nathaniel, Am justice	June 26	Harrison, Maud, Am actr	April 28
Spencer, Samuel, Am R. R. pres	Nov 29	Haskell, Edwin Bradbury, Am ed	March 25
Stevens, Alfred, Belg painter	Aug 24	Haswell, Charles Haynes, Am civ. eng	May 12
Stevens, Charles E., Am clerg	Aug 28	Havemeyer, Henry O., Am financ	Dec 4
Stillman, Thomas E., Am financ	Sept 5	Heilprin, Angelo, Dan expl	July 17
Swift, Edwin C., Am packer	April 5	Herschel, Alexander Stuart, Eng astron	June 18
Thayer, John M., Am statesman	March 19	Higgins, Frank W., Am, ex-gov N. Y.	Feb 12
Thornton, Sir Edward, Eng dip	Jan 26	Hodder, Alfred, Am author	March 3
Tidball, John Caldwell, Am army off	May 15	Holabard, Samuel Beckley, Am brig-gen	Feb 4
Toole, John Lawrence, Eng actor	July 30	Holmes, Mary Jane, Am writer	Oct 7
Torrance, David, Am jurst	Sept 5	Hooker, Isabella Beecher, Am phlan	Jan 25
Train, Charles J., Am navy off	Aug 4	Howard, Ada Lydia, Am edu	March 4
Trepoff, Dmitre Feodorowich, Rus pub off	Sept 15	Huffcut, Ernest Wilson, Am lawy-edu	May 4
Uhl, Edward, Ger-Am pub	Aug 1	Hughes, Clovis, Fr publicist	June 11
Ward, Henry A., Am scien	July 4	Huysmans, Joris Karl, Fr author	May 12
Warner, Willard, Am statesman	Nov 23	Ingersoll, Edward Payson, Am theo	Feb 4
Weir, Harrison W., Eng painter-author	Jan 4	James, Daniel Willis, Am merc	Sept 13
Wesson, Daniel Baird, Am invent	Aug 4	Jastremski, Leon, Am pol-sol	Nov 29
Wheeler, Joseph, Am may-gen	Jan 25	Joachim, Joseph, Ger violinist	Aug 15
Whitney, Adeline Dutton Train, Am author	March 21	Jones, Mrs William G., Am actr	June 13
Wiswell, Andrew Peter, Am jurst	Dec 3		
Wood, Thomas J., Am army off	Feb 6		
Yeamans, Jennie, Am actress	Nov 28		
Yeomans, James D., Am dip	Oct 31		
Verkes, Charles T., Am financ	Dec 29		

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	Date of Death		Date of Death
Kantz, Albert, Am nav off	Feb 5	Abbot, Edward, Am clerg-author	April 5
Kearney, Dennis, Am labor leader	April 24	Adler, Friedrich, Ger architect-writer	Sept 15
Kelvin, Lord William Thompson, Sc scien	Dec 17	Aiden, William Livingston, Am author	Jan 14
Kelmeys, Edward, Eng sculp	May 1	Alexis, Alexandrovitch, Rus Gr Duke	Nov 14
Knight, Joseph, Eng ed	June 24	Allison, William Boyd, Am statesman	Aug 4
Lamsdorf, Vladimir Nicolaievitch, Russ	For	Amicus, Edmondo de, It. writer	March 11
Min	March 19	Anthony, William Arnold, Am physicist	May 29
Loewy, Maurice, Fr astron	Oct 15	Armijo, Don Antonio Aguilar, Sp statesman	June 13
Loring, Charles Harding, Am nav off	Feb 5	Astor, Mrs William, Am society leader	Oct 30
McClintock, Sir Francis Leopold, Eng nav Ad	Nov 17	Ayrton, William Edward, Eng elec engineer	Nov 8
McComas, Lories Emory, Am jurist-statesman	Nov 10	Baich, George Beall, Am naval off	April 16
McGhee, Charles McClung, Am R.R. off	May 5	Banks, Sir John, Ir phy	July 6
McKinley, Ida, Am wid President McKinley	May 26	Batcheller, George Sherman, Am jurist	July 2
McNally, Frederick, Am pub	Sep 16	Beccquerel, Henri, Fr physicist	Aug 15
Magill, Edward Hicks, Am edu	Dec 5	Belmont, Oliver Hazard Perry, Am banker	June 10
Magruder, Julia, Am author	June 9	Bethune, Thomas G, Am pianist	June 13
Malot, Hector Heime, Fr author	July 18	Bikelas, Dimitrios, Gr poet	July 21
Mansfield, Richard, Am actor	Aug 30	Bird, Frederick Mayer, Am hymnologist	April 2
Markoe, Francis, Am surg	Sept 13	Blumenthal, Jacques, Ger-Eng pianist	May 18
Maso, Bartolomeo, Cuban leader	June 14	Bossier, Marie Louis Gaston, Fr writer	June 10
Masson, David, Sc hist	Oct 7	Bonner, Hugh, Am fire official	March 13
Mathol, William L., Am pub. off	Nov 22	Bourne, Edward Gaylord, Am historian	Feb 24
Mossan, Henri, Fr chem	Feb 20	Bromfield, Edward Thomas, Am clerg	July 27
Moore, John, Am army off	March 18	Brooks, William Keith, Am zoologist	Nov 11
Morgan, John Tyler, Am statesman	June 11	Brough, Bennett H, Eng manuf	Oct 3
Morris, Sir Lewis, Eng poet	Nov 12	Bruce, Sir George Barclay, Eng engineer	Aug 25
Munn, Orson D., Am pub	March 1	Bryan, William James, Am statesman	March 22
Murphy, Francis, Am temp. ref	June 30	Buller, Sir Redvers Henry, Eng sol	June 2
Murray, David Chrystie, Eng author	Aug 2	Busch, Wilhelm, Ger caricaturist	Jan 9
Newton, Alfred, Eng ornithol	June 7	Campbell, Lewis, Sc-Gr edu	Oct 25
Olcott, Henry Stell, Eng Theophist leader	Feb 17	Campbell-Bannerman, Sir Henry, Eng statesman	Apr 22
Oscar II, King of Sweden	Dec 8	Canet, Gustave, Fr artillerist	Sept 24
Outhwaite, Joseph H., Am statesman	Dec 9	Canning, Sir Samuel, Eng elec engineer	Nov 9
Parker, Cortlandt, Am lawy	July 29	Carmack, Edward Ward, Am pol	Nov 9
Patton, John, Am statesman	May 24	Caron, Sir Adolphe Can ex-Min Militia, Postmaster	April 20
Pentecost, Hugh Owen, Am Soc leader	Feb 2	Gen., etc	March 17
Perkin, Sir William Henry, Eng chem	July 14	Casah del Drago, Rom Cath card	Oct 27
Perkins, Charles E., Am R.R. pres	Nov 8	Casanas y Paege, Salvatore, Rom Cath card	Oct 27
Pettuns, Edmund W., Am statesman	July 27	Cavendish, Spencer Compton, Eighth Duke Devon	March 24
Pinkerton, Robert Allen, Am detective	Aug 12	shure	April 20
Pobiedonostzeff, Constantine Petrovitch, Rus	Proc	Chadwick, Henry, Am editor-sportsman	March 2
Synod	March 23	Chamberlain, Jacob, Am missionary	May 3
Pugh, James Lawrence, Am statesman	March 9	Charles I, King Portugal	Feb 1
Rasin, I Freeman, Am pol. leader	March 9	Chaulnes, Emanuel Theodore Bernard Marie D'Albert	Jan 7
Rees, John K., Am astron	March 10	de Lugues D'Ailly, Nuth Duke of	July 19
Regamey, Felix, It painter	May 5	Cheetham, Samuel, Eng archdeacon	June 24
Rixey, John Franklyn, Am statesman	Feb 9	Cleveland, Grover, ex-president U S	Jan 28
Roosevelt, George W., Am consul	April 15	Coburn, John, Am congressman	Dec 5
Root, Oren, Am edu	Aug 26	Coghlan, Joseph Bullock, Am naval off	March 24
Ross, Edmund Gibson, Am dip	May 8	Colbin, Sir Auckland, Eng col off	May 23
Routh, Edward John, Eng scien	June 7	Coppée, Francois, Fr writer	July 22
Ruger, Thomas Howard, Am army off	June 3	Cremier, Sir William Randal, Eng dip	May 27
Russell, William Hamilton, Am arch	July 23	Crownshield, Arent Schuyler, Am naval off	May 11
Russell, William Howard, Eng journ	Feb 10	Cullingworth, Charles James, Eng phy	July 11
Ryland, Joseph H., Am clerg	Sept 24	Curtis, Alfred Allen, Am Rom Cath bishop	April 12
Saint-Gaudens, Augustus, Am sculp	Aug 3	Cutcheon, Byron M., Am sol	Jan 8
Saraoff, Boris, Bulg. rev	Dec 12	Cutting, Frederick L., Am ins com	May 23
Sergeant, Henry C., Am invent	Jan 31	Dailey, Peter F., Am actor	July 1
Sheffield, William Paine, Am jurist	June 2	Daniels, George Henry, Am R.R. off	Jan 29
Shrady, George F., Am surg-ed-author	Nov 30	Davis, Charles Abbott, Am naturalist	June 13
Slomp, Campbell, Am statesman	Oct 13	Deane, Sir Harold, Eng sol	July 6
Sloan, Samuel, Am R.R. magnate	Sept. 22	Derby, Frederick Arthur Stanley, Sixteenth Earl	June 14
Smith, Joseph Adams, Am nav off	Aug 18	Dix, Morgan, Am clerg	Feb 19
Stang, William, Am Rom Cath bish	Feb 2	Dodge, Francis Safford, Am sol	Jan 14
Stephenson, Samuel M., Am finan	July 31	Drachmann, Holger H H., Dan poet	April 6
Stoddard, James Henry, Am actor	Dec 9	Drury-Lowe, Sir Drury Curzon, Eng sol	March 2
Sully-Prudhomme, René Francois, Fr poet	Sept 7	Duncan, William Wallace, Am Mth-Eps bishop	June 5
Svampa, Domenico, It Rom Cath card	Aug 10	Duro, Capt Cesareo Fernandez, Sp naval author	March 12
Swayne, Charles, Am jurist	July 5	Dyas, Ada, Gr actress	July 20
Taft, Louise M., mother President Taft	Dec 8	Dyer, Louis, Am edu	March 18
Taylor, George B., Am mission	Oct 3	Eliot, Sir John, Eng meteorol	July 18
Terhune, Edward P., Am clerg	May 25	Elmendorf, Joachim, Am clerg	Nov
Theunet, Andre, Fr writer	April 23	Erichsen, Mylus, Dan expl	Feb 23
Thring, Baron Henry, Eng jurist	Feb 5	Esmarch, Johannes Friedrich A von, Ger phy.	May 31
Thurber, Francis B., Am merc	July 4	Evans, Sir John, Eng antiquary	March
Tiffany, Charles Comfort, Am clerg	Aug 20	Ewald, Carl, Dan writer	March 26
Tilley, Benjamin F., Am nav off	March 18	Faulamb, James Remington, Am composer	June 3
Tilton, Theodore, Eng writer	May 25	Fausboll, Michael Viggo, Dan oriental sch	Sept 25
Townsend, William K., Am jurist	June 1	Ferdinand IV, Aus Archduke, Gr Duke Tuscany	Jan 17
Turnill, Henry S., Am army off	May 24	Fergusson, Arthur Walsh, Am dip	Jan 29
Tyler, Alfred Lee, Am R.R. magnate	June 1	Fessenden, Samuel, Am statesman	Dec 25
Underwood, Lucien, Am botan	Nov 16	Fevier, Louis Francois, Fr sol	Aug 29
Varnum, James M., Am law	March 26	Fithian, Edward, Am naval eng	July 9
Varry, Edwin, Am actor	May 4	Fitzgerald, Sir Thomas, Australian surg	Nov 9
Walker, John Grimes, Am nav off	Sept 16	Fletcher, James, Eng-Can bot	March 20
Walker, Joseph Henry, Am statesman	April 3	Fowler, Charles Henry, Am Meth-Eps bishop	June 1
Walter, Alfred, Am cor. pres	Feb 13	Frechelte, Louis Honore, Fr-Can poet	March 7
Warren, Minton, Am edu	Nov 26	Freer, Frederick Warren, Am painter	May 24
Watson, John (Ian MacLaren) Sc author	May 6	Fulleylove, John, Eng. painter	Nov 4
Whitely, William, Eng merc	Jan 24	Gardiner, Edward G., Am marine biologist	March..
Wilberforce, Ernest Roland, Eng bish, Chmchester	Sept 9	Garrett, Patrick F., Am ranger	Nov 29
Wilcox, Orlando B., Am army off	May 10	Gaudry, Jean Albert, Fr paleontologist	April 21
Willard, Joseph Flynt, Am sociol	Jan 20	Gebhart, Emil, Fr writer	
Willcox, David, Am R.R. pres	April 24		
Williams, John Joseph, Am Rom Cath. archbish	Aug 30		
Wilson, Kate Dennin, Am actress	Feb 4		
Wint, Theodore J., Am army off	March 21		
Wormser, Isidor, Am banker	June 21		
Wyeth, John, Am merc	March 30		

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	Date of Death		Date of Death
Gevaert, Francois Auguste, Belg composer	Dec 28	Porter, Benjamin Curtis, Am. painter	April 2
Gibbs, Oliver Wolcott, Am. scien	Dec. 9	Privetti, Giulio, It. statesman	June 6
Gilman, Daniel Colt, Am. edu	Oct. 13	Proctor, Redfield, Am. statesman	Mar. 4
Greenough, John James, Am. inventor	Aug. 25	Ranc, Arthur, Fr. pol	Aug. 10
Halderman, John A., Am. sol. dip	Sept. 21	Randall, James Ryder, Am. journ. poet	Jan. 14
Halevy, Ludovic, Fr. dramatist	May 7	Reid, Sir Robert, Newfoundland R. cont	June 3
Hall, Charles Cuthbert, Am. theo	March 25	Richard, Francois Marie Benjamin, Fr. Rom. Cath. card	Jan. 28
Hamy, Theodore Jules Earnest, Fr. anthropologist	Nov. 18	Roose, Daniel Bennett, Am. phy	March 8
Hansky, Alexander, Rus. solar physicist	Aug. 11	Rudin, Antonia Starabba, Marquis di, It. statesman	Aug. 7
Hardy de Penn, Gen., Fr. sol-author	July 2	Sackville-West, Sir Lionel, Eng. dip	Sept. 3
Harris, Joel Chandler, Am. author	July 3	Salmeron, Nicholas, Sp. statesman	Aug. 21
Haven, George Grnsword, Am. banker	March 18	Samuels, Samuel, Am. sea capt	May 18
Headlam, Walter George, Eng. sch	June 19	Sankey, Ira David, Am. evang	Aug. 13
Heath, Daniel Collamore, Am. pub	Jan. 28	Sarasate, Navascues, Pablo M. M., Sp. violonist	Sept. 20
Hebert, Antoine, Fr. painter	Nov. 5	Sardou, Victorien, Fr. dram	Nov. 8
Hibbert, Sir John Tomlinson, Eng. pol	Nov. 7	Sargent, Frank Pierce, Am. lab. leader	Sept. 4
Hiscox, Gardner Dexter, Am. engineer	Sept. 13	Satterlee, Henry Yates, Am. Episc. bish.	Feb. 22
Hopkins, Henry, Am. edu	Oct. 18	Satterlee, Walter, Am. painter	May 28
Horstman, Ignatius Frederick, Am. Rom. Cath. bish.	May 13	Sawyer, Charles Henry, Am. ex-Gov. N. H.	Jan. 18
Hosley, Harry Hibbard, Am. Commander U. S. Nav.	Jan. 6	Schotter, Leopold von Chnsteli, Austrian phy.	April 21
Hosner, Harriet Goodhue, Am. sculp.	Feb. 21	Selldinge, Thomas E., Am. sol	Sept. 17
Hourbronn, Frederick, Fr. artist	Oct. 19	Senn, Nicholas, Am. surg	Jan. 2
Howard, George Bronson, Am. playwr	Aug. 4	Shuvaloff, Paul, Count, Rus. sol. dip.	April 3
Hovatt, Alfred William, Eng. scien	March 8	Smith, Charles Emory, Am. journ.-pub. off.	Jan. 19
Hubschmann, Johannes Heinrich, Ger. philologist	Jan. 21	Snow, Francis Huntington, Am. Edu. scien.	Sept. 20
Hutchinson, John Wallace, Am. singer	Oct. 29	Spooford, Answorth Rand, Am. librarian	Aug. 1
Ibbertson, Sir Denzil, Eng. col. off	Feb. 21	Sprekels, Claus, Ger.-Am. sugar manuf.	Dec. 26
Ignatieff, Nikolai Pavlovitch, Rus. dip	July 4	Stedman, Edmund Clarence, Am. poet-critic-banker	Jan. 18
Ingalls, Charles Russell, Am. jurst.	May 28	Stensburg, Herman Speck von, Baron, Ger. dip.	Aug. 23
Inouye, Hikaru, Jap. gen	Dec. 16	Stevens, Arthur White, Am. dip. advisor	March 25
Jacquer, Achille, Fr. engraver	Oct. 30	Stevens, Francis B., Am. civ. eng.	May 24
Janssen, Peter, Ger. painter	Nov. 7	Strachey, Sir Richard, Eng. col. off	Feb. 12
Jeli, George Edward, Eng. edu	Nov. 19	Strobel, Edward Henry, Am. dip	Jan. 15
Jenks, George Augustus, Am. lawy	Aug. 10	Sucher, Josef, Austrian comp.	April 4
Jesup, Morris Ketchum, Am. banker	Jan. 22	Sutherland, Mrs. Evelyn Greenleaf, Am. playwr	Dec. 24
Johnson, David, Am. painter	Feb. 4	Swan, Henry Frederick, Eng. ship designer	March 25
Joly de Lotbiniere, Sir Henry Gustave, Can. statesman	Nov. 16	Thumann, Paul, Ger. painter	Feb. 1
Kane, Theodore, F., Am. naval off.	March 14	Turr, Stephen, Hung. sol.	May 2
Karsten, Hermann, Ger. naturalist	Aug. 1	Tze-Hsi (or Tsai-an), Ch. Dow.-Empress	Nov. 15
Kaufmann, Richard von, Ger. econ	March 12	Ulrich, Charles Frederick, Am. painter	May 15
Kellerman, William Ashbrook, Am. bot	March 8	Vost, Carl von, Ger. physiol.	Jan. 31
Kielhorn, Lorenz Franz, Ger. sch.	Feb. 28	Walton, Sir John Lawson, Eng. Atty.-Gen.	Jan. 18
Killam, Albert Clements, Can. jurst.	Feb. 28	Waugh, Benjamin, Eng. philan.	March 11
King, Tom C., American metallurgist	Feb. 27	Whyte, William Pinkney, Am. statesman	March 11
Kingston, Charles Cameron, Austral. statesman	May 11	Wolff, Sir Henry Drummond, Eng. dip	Oct. 11
Knowles, Sir James, Eng. ed.	Feb. 13	Wormeley, Katherine Prescott, Am. trans-author	Aug. 4
Kretschmer, Edmund, Ger. comp.	Sept. 14	Worthington, George, Am. Episc. bish.	Jan. 7
Kwang-Hsu, Ch. Emperor	Nov. 14	Wright, John Henry, Am. archaeol.	Nov. 25
Lambeaux, Josef, Belg sculp.	June 6	Wullner, Adolf, Ger. physicist.	Oct. 2
Landelle, Charles, Fr. painter	Oct. 18	Wyckoff, Walter Augustus, Am. econ.	May 15
Lanham, Samuel Willis Tucker, Am. ex-gov. Tex.	July 29	Yamashina, Prince, Jap. meteorol.	May 2
L'Arronge, Adolf, Ger. dram-theat. man	May 25	Young, Charles Augustus, Am. astron.	Jan. 4
Latimer, Henry Churchill, Am. statesman	Feb. 20	Zeller, Eduard, Ger. theo	March 19
Law, Sir Edward Fitzgerald, Eng. dip.	Nov. 1		
Lawler, Thomas G., Am. com-in-ch. G. A. R.	Feb. 3		
Leot, Victor, Lucien Sulpire, Rom. Cath. card.	Dec. 21		
Lee, Leslie Alexander, Am. biol.	May 20		
Leydet, Victor, Fr. statesman	Oct. 23		
Leydet, Franz von, Ger. zool	May 13		
Lie, Jonas Lauritz Edemil, Nor. poet-novl	July 6		
Liebreich, Oskar, Ger. pharm.	July 2		
Linnvitch, Nicholas Petrovitch, Rus. Com-in-ch.	April 23		
Loe, Walter von, Ger. field-mar.	July 6		
Low, Albert, Jew writer	May 21		
Lucius, Friedrich Karl Herman von, Ger. ch. civ. cab.	Aug. 2		
Lucca, Pauline, Ger. singer	Feb. 28		
Luozozewska, Hedwig, Pol. poet	Sept. 23		
Lyne, Joseph Leycester, Eng. mus	Oct. 10		
Mac Donald, James W. A., Am. sculp.	Aug. 14		
Mac Dowell, Edward Alexander, Am. comp.	Jan. 23		
Mackay, Donald Sage, Am. clerg.	Aug. 27		
Maignan, Albert, Fr. painter	Sept. 29		
Malet, Sir Edward Baldwin, Eng. dip.	June 29		
Marchesi, Salvatore, It. singer	Feb. 20		
Marty, Georges, Fr. comp.	Oct. 11		
Mascart, Eleuthere Elie Nicholas, Fr. physicist.	Aug. 26		
Mason, Otis Tufton, Am. ethn.	Nov. 5		
Mathieu, Francois Desure, Fr. Rom. Cath. card.	Oct. 26		
Melne, James Elorant, Am. pub. off.	July 23		
Menscal, Amiceto Garcia, Am. civ. eng.	July 20		
Merrill, George Edmunds, Am. clerg.-edu.	June 11		</

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Date of Death	Date of Death
Brough, Lionel, Eng actor	Nov 8
Brower, Daniel Roberts, Am neurol	March 1
Buchanan, William Innes, Am dip	Oct 17
Buck, Dudley, Am comp	Oct 6
Bull, William Tillinghast, Am surg	Feb 22
Bulow, Frieda, Baroness von, Ger author	March 12
Burne, Sir Owen Tudor, Eng army off	June 27
Burt, George Albert, Am R.R. pub off	March 11
Burton, Frederick Russell, Am comp.	Sept 30
Bush, Charles Green, Am cartoonist	May 21
Butler, Arthur Grey, Eng clerg-edu	Jan 16
Butler, John George, Am clerg	Aug 2
Butler, Matthew C, Am statesman	April 14
Cable, Ransom R., Am R.R. off	Nov 12
Cama, Kharshedji Rustamji, Ind Orientalist	Sept, date unknown
Canfield, James Hulme, Am libr	March 29
Carey, Rosa Nouchette, Eng author	July 19
Carlos de Bourbon, Sp pretender to throne	July 18
Carpenter, George Rice, Am edu	April 8
Cazals, Henri, Fr poet	July, date unknown
Cervera, y Topete, Pascual, Sp Admiral	April 3
Chabranin, Countess de, Fr writer-actr	Feb 19
Chang-Chi-Tung, Ch statesman	Oct 4
Chapman, Henry Cadwallader, Am phy-naturalist	Sept 8
Charpentier, Alexandre, Fr sculp-artist	March 4
Chase, Solon, Am farm-pol	Nov 23
Chauchard, Hippolyte Francois, Fr merc.	June 5
Choisy, F Auguste, Fr arch-archaeol.	Sept 20
Clarke, Dumont, Am banker	Dec 26
Cochran, David Henry, Am edu	Oct 4
Collier, Peter Fenelon, Am pub	April 23
Comee, Frederick R., Am musc	April 16
Conness, John, Am statesman	Jan 9
Conried, Heinrich, Am musc-dir	April 27
Converse, George Albert, Am nav off	March 29
Cookson, Bryan, Eng astron	Sept 13
Coppinger, John Joseph, Am army off	Nov 4
Coquelin, Alexandre Honore Ernest, Fr actor	Feb 8
Cosgrove, Samuel G., Am ex-gov Wash	March 28
Cotter, Joseph B., Am Rom Cath bish	June 28
Cotton, Charles Stanhope, Am nav off	Feb 19
Crawford, Francis Marion, Am author	April 8
Cretoni, Serafin, It Rom Cath Card	Feb 23
Crittenden, Thomas Theodore, Am ex-gov Mo.	May 29
Cunningham, John Daniel, Sc anatomist-edu	June 23
Cushman, Francis W., Am statesman	July 6
Cust, Robert Needham, Eng col. off.	Oct 28
Cuyler, Cornelius C., Am banker	July 31
Cuyler, Theodore Ledyard, Am clerg	Feb 26
Dandridge, Mrs. Elizabeth, Am. daughter Pres Taylor	July 26
Davidson, John, Eng poet-playw	March or April
De Armond, David A., Am statesman	Nov 23
De Morgan, Henri, Fr archaeol	Dec, date unknown
Dhanis, Baron, Belg expl	Nov 13
Dodge, Theodore Ayrault, Am sol-hist.	Oct 26
Dohrn, Anton, Ger zool.	Sept 29
Drum, Richard Coulton, Am army off	Oct 15
Drummond, Sara King, Am author.	March 7
Drysdale, Learmont, Sc. comp	July, date unknown
Ducey, Thomas James, Am Rom Cath priest	Aug 22
Duhamel, Joseph Thomas, Can Rom Cath priest	June 5
Durham, Israel W., Am pol	June 28
Dutcher, Silas Belden, Am cap't list.	Feb 10
Eddy, William Abby, Am meteorol.	Dec 26
Edwards, William Henry, Am naturalist	April 3
Egger, Victor Emil, Fr phil.	March, date unknown
Elgar, Francis, Eng nav arch	Jan 17
Elmslie, George Robert, Eng Ind off	May 26
Elwin, Elmer Henry, Eng Anglican bish.	Nov 11
Engelmann, Wilhelm, Ger physiol.	May 20
Ensign, Amos Merchant, Am joura	Feb 3
Evans, George Essex, Austral. poet.	Dec, date unknown
Fabbri-Muller, Inez, Aus. singer	Aug 31
Fenn, George Manville, Eng author	Aug 27
Ferrer, y Guardia, Francisco, Sp edu-anarch.	Oct 13
Fitch, Clyde Williams, Am dram.	Sept 4
Fitzgibbon, Gerald, Ir jurist	Oct 14
Florian, Walter, Am artist	April 1
Fournier, Charles Antoine, Fr writer-critic	Oct, date unknown
Fox, Wilcox, Eng statesman	Jan 21
Franklin, Samuel Rhodes, Am nav off.	Feb 24
Fritch, William Powell, Eng artist	Nov 2
Gallifet, Gaston Alexandre August, Marquis de, Fr mil. off	July 8
Galloway, Charles Betts, Am Meth-Episc bish.	May 12
Garrison, William Lloyd, Am publicist.	Sept 12
Geronomo, Am Ind Ch	Feb. 17
Gilder, Richard Watson, Am poet-ed	Nov. 18
Gillespie, George D., Am Episc bish.	March 19
Gottschall, Rudolph von, Ger author.	March 21
Gregory, Edward John, Eng painter	June 22
Gruyer, Francois, Fr chem.	Nov, date unknown
Gunzburg, Horace, Baron de, Ger phlan.	March 2
Gwydyr, Robert Burrell, Eng oldest peer.	April 3
Haines, Sir Frederick Paul, Eng field mar	June 11
Hale, Edward Everett, Am author-clerg.	June 10
Hansen, Emil Christian, Ger Botan	Aug 27
Harriman, Edward Henry, Am R.R. pres -capt'l st	Sept 9
Harris, William Allen, Am statesman	Dec 20
Harris, William Torrey, Am pub off	Nov 5
Helper, Hinton Rowan, Am writer-pub off	March 9
Henderson, Isaac, Am musc critic-playw	April 1
Hesse, Anton, Ger sculp	April 12
Hey, Julius, Ger musc	May 15
Hilkov, Prince Michael, Rus statesman	March 21
Hirsch, Max, Rus econ	March 4
Hitchcock, Ethan Allen, Am pub off	April 9
Hoffman, Richard, Am pianist	Aug 17
Hoffman, Hans, Ger poet	July, date unknown
Holbrook, Frederick, Am ex-gov Vt	April 27
Holder, Sir Frederick William, Eng Austral. pub off	July 22
Holdich, Sir Edward Allen, Eng mil off	Dec 8
Holle, Ludwig von, Ger sch-pub off	Dec 23
Holstein, Frederich von, Ger dip	May 8
Hough, George Washington, Am astron.	Jan 1
Howard, Oliver Otis, Am army off	Oct 26
Howe, William Wirt, Am jurist	March 17
Hughes, Robert P., Am army off	Oct 28
Iglesias, Miguel, Peruvian sol-statesman	Nov 8
Imber, Naphtali Herz, Yid poet	Oct 8
Ito, Prince Hirobumi, Jap statesman	Oct 26
Jewett, Sarah Orne, Am author.	June 24
Johnson, John Albert, Am ex-gov Minn	Sept 21
Johnson, Martin Nelson, Am statesman	Oct 21
Jones, Sir Alfred Lewis, Eng ship builder.	Dec 13
Jones, John William, Am clerg	March 17
Karpoff, Col., Rus Ch police	Dec 22
Kelly, Edmund, Am. lawy	Oct 3
Kennedy, John Stuart, Am banker-philan	Oct 31
Kidder, Benjamin Harrison, Am nav off	Oct 27
King, William Frederick, Am merc	Feb 19
Kleeberg, Clotilde, Ger pianist	March 5
Kotze, Stefan von, Ger writer	April 22
Laffan, William M., Am pub	Nov 19
Lancaster, Thomas, Am climatol.	Feb 18
Lang, Benjamin Johnson, Am musc	April 4
Lassalle, John, Fr singer	Sept 27
Lassiter, Francis Reeves, Am statesman	Oct 31
Lathrop, Francis, Am artist	Oct 18
Leicester, Earl of, Eng nob	Jan 24
Lefebvre, Eugene, Fr aviator	Sept 8
Lemly, Samuel Conrad, Am nav off	Sept 4
Leopold II, King Belg	Dec 17
Lilley, George Leavens, Am ex-gov Conn	April 21
Lindsay, William, Am statesman	Oct 15
Lodge, George Cabot, Am poet	Aug 22
Lombroso, Cesare, It criminol	Oct 19
Loomis, Horatio, Am chem	Feb 2
Loop, Jeannette Shepperd, Am painter	April 17
Lorillard, Mrs Caroline J., Am society leader	March 25
Lowry, Thomas, Am R.R. pres	Feb 4
McCarren, Patrick Henry, Am pol.	Oct 22
Macchi, Maria di, It singer	Jan 20
McCloskey, William George, Am Rom Cath bish	Sept 17
McKim, Charles Follen, Am arch	Sept 14
McLaurin, Anselm Joseph, Am statesman	Dec 22
McQuaid, Bernard John, Am Rom Cath bish	Jan 18
Manchester, Consuelo, Dowager Duchess of, Eng nob	Nov 30
Markbrecht, Leopold, Am pub off	July 27
Marlborough, Duchess of, Eng nob	Jan 11
Martens, Friedrich Fromhold von, Rus jurist	June 20
Martin, Theodore, Eng statesman	Aug 13
Matteucci, Vittorio Raffaele, It seismol	July 16
Mendelssohn-Bartholdy, Ernest von Ger banker.	Dec 24
Mendes, Catulle, Fr author	Feb 8
Meredith, George, Eng author-poet	May 18
Michael Nikolaievitch, Rus. Gr Duke	Dec 18
Messel, Alfred, Ger arch	March 24
Miller, Joseph Nelson, Am nav off	Sept 11
Milligan, Robert Wiley, Am nav off.	Oct 14
Modjeska, Helena, Pol-Am actr.	April 8
Moffitt, John R., Am invent	Nov 15
Mond, Ludwig, Ger chem.	Dec 11
Monson, Sir Edmond John, Eng. dip	Oct 29
Monstiers-Mervinville, Mary Gwendolyn (Caldwell) Marquise des	Oct 5
Moor, Sir Ralph Denham Rayment, Eng pub. off	Sept 14
Morganstern, Lina (Bauer), Ger reformer.	Dec
Morrison, William Ralls, Am statesman	Sept 30
Navarro, Jose Francisco de, Sp. eng finan	Feb 2
Nehring, Wladislaw, Ger. sch	Feb 2
Neumayer, Georg von, Ger meteorol	May
Newcomb, Simon, Am astron	July 11
Noailles, Emmanuel, Marquis de Fr dip	Feb 16
Olcott, Frederick P., Am finan	April 15
Ordway, John Morse, Am chem-edu	July 3
Otis, Elwell Stephen, Am army off	Oct 21
Packard, William Alfred, Am schol	Dec 2
Palmer, William Jackson, Am R.R. off.	March 13
Passage, Comte de, Fr artist	March
Peckham, Rufus Wheeler, Am jurist.	Oct. 24
Penfield, William L., Am lawy	May 9
Petrosino, Joseph, It.-Am. detective.	March 13

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	Date of Death
Pierce, Elijah S., Am invent	Jan 13
Poire, Emmanuel (Caran Dache) Fr artist	Feb 26
Pope, Albert Augustus, Am manuf	Aug 10
Poynter, William A., Am ex-gov Neb	Feb
Prang, Louis, Am pub	June 15
Proust, Ebenezer, Eng musc	Oct 4
Pultzzer, Albert, Am journ	July 29
Pulliam, Henry Clay, Sm baseball off	March 3
Rand, William Wilberforce, Am clerg-author	Dec 8
Red Cloud, Am Ind Ch	Feb 25
Reid, Sir John Watt, Eng phy	Dec 26
Remington, Frederick, Am artist	Jan 15
Reyer, Ernest, Fr comp	July 9
Ripon, Marquis of (George Frederick Robinson)	May 19
Rogers, Henry Huttleston, Am finan	Jan 14
Roytzensky, Sinovi, Rus vice-admiral	Aug, 31
Rothschild, Oscar, Baron	Feb 3
Rowell, Charles, Eng pedestrian	Sept 7
Russell, Gordon W., Am phy	Nov 6
Shackelford, James, Am army off	Sept 14
Smalley, Bradley B, Am pol	July 1
Smilie, James David, Am painter	Nov 30
Smith, Clement Lawrence, Am edu	Sept 17
Smith, Charles Stewart, Am banker	April 4
Smith, William T., Am edu	Feb 2
Sonnenenthal, Adolph Ritter von, Ger actor	April 23
Spain, John H., Am cap't list	April 24
Stearns, William Morris, Am statesman	March 18
Stoddard, Charles Warren, Am author	Feb 11
Strong, Edward Trask, Am nav off	Jan 24
Sturgiss, Russell, Am Arch	Nov 19
Swinburne, Arthur, Can Archbishop-Primate	July 29
Swinburne, Algernon Charles, Eng poet	Feb 25
Tabb, John Bannister, Am Rom Cath priest-edu-	March 22
poet	May 1
Tait, John R., Am artist-author	June 9
Tegart, Moses, Sc poet	June 2
Thacher, John Boyd, Am pol leader	Jan 7
Thayer, Samuel R., Am dip	June 12
Thiery, Stephen, Am Rom Cath off	Sept 20
Thompson, William L., Am hymnol	March 2
Tilford, William H., Am capt'l st	Feb 22
Thompkins, Eugene, Am theat mang	Aug 15
Townsend, Edwin F., Am army off	June 24
Trego, William T., Am painter	April 21
Turpie, David, Am statesman	Sept 15
Tweedmouth, Baron, Eng nav. off	Oct 27
Van Wormer, John R., Am pol-banker	Feb. 27
Vladimir, Rus Gr Duke	June 28
Von Halle, Ernst, Ger econ	Sept 20
Ward, Seth, Am Meth-Episc. bish.	Feb 11
Warner, Charles, Eng actor	Sept 1
Weeks, Stephen Holmes, Am phy	Aug 2
Wells, Calvin, Am manuf	Jan 25
West, Caleb, Am ex-gov. Utah	Jan 11
Wharton, Joseph, Am manuf	March 8
Wilcox, Washington F., Am statesman	Oct 21
Wilson, Arthur, Eng shipper	May 9
Wilson Augusta J Evans Am wnter	Feb. 20
Wright, Carroll Davidson, Am econ edu	June 15
Wyse, Lucien Bonaparte, Fr explor.	March 10
Zalinski, Edmund Louis Gray, Am army off	Oct 19
invent	Dec 29
Zartman, Lester W Am econ-edu	
Zerrahn, Carl, Ger. musc.	

David Bennett Hill, also a one-time United States Senator from New York; George H. Williams, who was Attorney-General in Grant's first cabinet, and John Griffin Carlisle, former United States Treasurer. The United States Supreme Court lost its venerable Chief Justice, Melville W. Fuller, as well as Associate-Justice David Josiah Brewer. Among prominent scholars and thinkers who died were Sir William Huggins, the English astronomer; William James, the philosopher, Robert Koch, the famous German medical scientist, Prof Goldwin Smith, the historian; William G. Sumner, long professor of political and social science at Yale University; and Giovanni Schiaparelli, the Italian astronomer, who discovered the canals of Mars. John LaFarge, often spoken of as America's greatest painter; Pedro Montt, President of Chile, and Florence Nightingale, the "Angel of the Crimea," who established the first hospital in the world, were also claimed by the grim reaper. Late in November, too, came the announcement of the death of Count Leo Tolstoy. Following is a list of the most important persons who died during 1910, together with the date of death:

	Date of Death
Acton, John Adams, Eng sculptor	Oct 31
Agassiz, Alexander, Am naturalist, pres Calumet	March 27
Hecla Mining Company	Oct 31
Agnew, Sir William, Eng ex-M P, Chairman London	Sept 6
Punch Publishing Board	May 1
Albans, Elias Fernandes, S. A vice-President of	June 9
Chile	Feb 3
Alexis, General Nord, ex-President of Hayti	July 4
Ames, James Barr, Am dean Harvard Law School	Sept 22
Anderson, A. L., Am brig-gen	Aug 29
Andrews, Wesley R., Am politician-editor	Feb. 11
Atkinson, Louis E., Am statesman	Sept 20
Atwater, John W., Am statesman	May 25
Azad-ul-Mulk, Regent of Persia	April 25
Bahadur, Seid Mohammed, Khan of Khiva	Oct 10
Ballance, John G., Am brig-gen	May 3
Banta, Theodore M., Am. life insurance statisti-	Feb 2
cian	Dec. 7
Barker, George Frederick, Am physicist-inventor	Nov. 17
Barboux, Henri, Fr Academician	Nov. 2
Barlow, C. M., Am Editor	Nov. 2
Bartlett, Edward Theodore, Am jurst	Nov. 2
Belden, Mrs. Jessie Von Zile, Am author	Nov. 2
Beard, W. D., Am jurist	Nov. 2
Benedict, Frank Lee, Am author-editor	Nov. 2
Berliner, Solomon, Am consul at Tenerife	Nov. 2
Berne-Bellecour, Etienne Prosper, Fr painter	Nov. 2
Betz, John P., Jr., Am capitalist	Nov. 2
Beveridge, John L., Am. ex-Gov. Illinois	Nov. 2
Biddle, Crag, Am jurst	Nov. 2
Biddle, James, Am. brig-gen	Nov. 2
Bjornson, Bjornstjerne, Norwegian author-play-	Nov. 2
wright-poet-publicist	Nov. 2
Blackwell, Elizabeth, Eng physician-author	Nov. 2
Blackwell, Emily, Am hospital founder	Nov. 2
Blodgett, Rufus, Am ex-U S Senator	Nov. 2
Booth (Schoeffel) Agnes, Am actress	Nov. 2
Borja, Caesar, Ecuadoran Min. Finance and Public	Nov. 2
Credit	Nov. 2
Bowers, Lloyd W., Am solicitor-Gen of U. S.	Nov. 2
Boune, Rev. Dr. Borden P., Am theologian-writer	Nov. 2
Bradley, L. P., Am brig-gen	Nov. 2
Brady, John, Am auxiliary bishop of Roman Catholic	Nov. 2
Diocese of Boston	Nov. 2
Brayton, Charles R., Am politician	Nov. 2
Brewer, David Josiah, Am Asso Justice U. S. Supreme	Nov. 2
Court	Nov. 2
Brewer, William Henry, Am explorer-educator	Nov. 2
Bristol, Augusta Cooper, Am author-poet-lecturer	Nov. 2
Broward, Napoleon Bonaparte, Am. ex-Gov. Florida-	Nov. 2
U. S. Senator elect	Nov. 2
Browne, Tony, Eng cartoonist-painter	Nov. 2
Brownlow, Walter Preston, Am statesman	Nov. 2
Bryan, Edward, P. Am. ex-vice-pres. Interborough	Nov. 2
Rapid Transit Company of New York	Nov. 2
Bryant, David E., Am. jurst	Nov. 2
Buckham, Matthew Henry, Am. educator	Nov. 2
Burgess, Neil, Am. actor	Nov. 2
Burrell, Frank A., Am. editor	Nov. 2
Burwell, William Turnbill, Am rear-admiral	Nov. 2
Butler, Gen. Sir William Francis, Eng soldier-diplo-	Nov. 2
mat	Nov. 2

Necrology, 1910. Death claimed a rich harvest of genius during the year 1910. Perhaps the most notable death was that of King Edward VII of Great Britain. This country lost through death Samuel Langhorne Clemens, known and beloved in all countries as "Mark Twain"; Julia Ward Howe, the venerable humanitarian, who was author, among many other notable poems, of the 'Battle Hymn of the Republic' and John Quincy Adams Ward, the most noted sculptor in the United States. Norway lost a leading literary light, too, in Bjornstjerne Bjornson. The United States Senate lost heavily through death, Alexander Stephen Clay, Senator from Georgia; John Warwick Daniel, Senator from Virginia; Samuel Douglas McEnery, Senator from Louisiana; and Johnston P. Dolliver, Senator from Iowa, all passing away during the year. Other prominent political figures to join the "great majority" were Thomas Collier Platt, former United States Senator from New York, and long the Republican leader in that State;

NECROLOGY, 1910

	Date of Death	Date of Death	
Byrnes, Thomas F., Am. public official	May 8	Furnival, Frederick J., Eng. Shakespearian scholar	July 2
Call, Wilkinson, Am. ex-U. S. Senator	Aug 24	Galle, Johann Gottfried, Ger. astronomer	July 10
Candler, Allen D., Am. ex-Gov. Georgia	Oct 26	Gans, Joseph, Am. ex-champion lightweight boxer	Aug 10
Carlisle, John Griffin, Am. statesman-ex-Secretary of Treasury	July 31	Gardiner, Mills, Am. statesman	Feb 20
Carleton, Henry Guy, Am. playwright	Dec 10	Genth, Frederick A., Am. chemist	Sept 2
Carr, Eugene A., Am. brig-gen	Dec 2	Giffen, Sir Robert, Eng. journalist	April 12
Chanute, Octave, Am. inventor	Nov 23	Gillibert, Charles, Am. opera singer	Oct 12
Chartres, Duke of, Fr. Orleanist prince	Dec 5	Gillis, James H., Am. rear-admiral	Dec 6
Chavez, George, Peruvian aviator	Sept 3	Gilmore, Samuel Lewis, Am. statesman	July 18
Chipman, Henry L., Am. brig-gen	Oct 25	Gobin, John P. S., Am. ex-Commander-in-chief	May 1
Chulalongkorn I., King of Siam	Oct 24	Goddard, Ely, Am. mining and railroad official	Oct 19
Cisneros, Salvador, ex-President Cuban Republic	Oct 22	Goodyear, Ellsworth, D. S., Am. brig-gen	Sept 3
Clarke, Creston, Am. actor	March 21	Graham, James F., Am. journalist	Jan 31
Clay, Alexander Stephen, Am. statesman, U. S. Senator	Nov 13	Grant, Hugh J., Am. ex-Mayor New York City	Nov 3
Clemens, Samuel Langhorne (Mark Twain), Am. humorist-author-lecturer	April 21	Griggs, James Matthew, Am. statesman	Jan. 6
Clement, Clay, Am. actor-dramatist-writer	Feb 21	Groucher, John W., Am. poet	Sept 20
Collins, Lottie, Eng. actor	May 3	Gude, Ove, Norwegian Minister to U. S.	July 1
Comfort, George Fisk, Am. art critic	May 5	Hammond, Rev. Edward Payson, Am. Evangelist-writer	Aug 14
Comstock, Cyrus B., Am. brig-gen	May 28	Hannay, James, Canadian historian	Jan 12
Conterno, Luciano, It. composer-musical director	May 5	Hanson, John F., Am. railroad official	Dec 15
Converse, John H., Am. locomotive builder-philanthropist	May 3	Harper, William St. John, Am. painter-etcher	Nov 4
Cook, Joel, Am. statesman-journalist	Dec 15	Harris, Joseph S., Am. railroad ex-president	June 2
Covert, James W., Am. statesman	May 16	Hatzfeld-Wildenburg, Prince Francis, Ger. nobleman	Nov 4
Cross, George R., Am. journalist	Nov 28	Hasbrouck, Henry C., Am. brig-gen	Dec 17
Crozer, Samuel Aldrich, Am. capitalist	June 29	Havemeyer, Frederick Christian, Am. capitalist	April 26
Cruz, Anibel, Cuban Minister to U. S.	Dec 28	Hawke, James Albert, Am. rear-admiral	July 25
Cudahy, Michael, Am. capitalist	Nov 27	Hawkins, Hamilton S., Am. brig-gen	March 27
Curtis, Newton Martin, Am. brig-gen-ex-public official-statesman	Jan 8	Heap, David Porter, Am. brig-gen	Oct 25
D'Alecion, Duke Ferdinand Philippe Marie, Fr. nobleman	June 29	Herter, Christian A., Am. educator	Dec 5
DaCosta, John C., Am. surgeon	Dec 6	Hibbard, George A., Am. ex-mayor Boston	May 29
Daniel, John Warwick, Am. U. S. Senator	June 29	Hichborn, Philip, Am. rear-admiral	May 1
Darling, Flora Adams, Am. founder D. A. R.	Jan 6	Hill, David Bennett, Am. politician-ex-gov-New York-ex-U. S. Senator	Oct 20
Davis, Andrew Jackson, Am. spiritualist-author	Jan 13	Holman-Hunt, William, Eng. painter	Sept 7
Davis, Rebecca Harding, Am. writer	Sept 29	Homer, Winslow, Am. painter	Sept 30
Day, Rev. Dr. Charles Orrin, Am. theologian	April 5	Horowitz, Moses, Am. playwright	March 4
Dayton, Charles W., Am. jurist	Dec 6	Howe, Julia Ward, Am. author-poet-reformer	Oct 17
De Crespiigny, Claude Champion, Eng. athlete	May 18	Hoyt, Henry Martyn, Am. lawyer	Nov 20
De Beylie, Leon Marie Eugene, Fr. archaeologist	July 17	Hoyt, Rev. Dr. Wayland, Am. preacher-lecturer	Sept 28
Delagrang, Leon, Fr. aviator	Jan 4	Huggins, Sir William, Eng. astronomer	May 12
Delisle, Leopold Victor, Fr. historian	July 22	Hurd, Charles Edwin, Am. editor	April 22
De Vogue, Viscount Marie-Eugene-Melchior, Fr. historian-Academician	March 24	Hutun, Maurice, Fr. financier	March 16
Dexter, Henry, Am. philanthropist	July 11	Huyler, John S., Am. candy manufacturer	Oct 10
Dickins, Francis William, Am. rear-admiral	Sept 15	Inman, Hugh T., Am. financier	Nov 14
Dickinson, Charles Courtes, Am. financier	May 24	James, Louis, Am. actor	March 5
Dile, James Brooks, Am. jurist	Dec 2	James, William, Am. philosopher	Aug 27
Dodge, Charles Cleveland, Am. gen.	Nov 4	Jessup, Henry H., Am. missionary-author	April 28
Dodsworth, William, Am. editor	Feb 8	Jewett, Charles, Am. physician	Aug 6
Dolliver, Jonathan P., Am. U. S. Senator	Oct 15	Jones, Gilbert Edward, Am. journalist	Nov 2
Donnelly, Henry V., Am. actor-manager	Feb 16	Johnston, George D., Am. brig-gen	Dec 8
Donahue, John F., Am. publisher-financier	Nov 30	Johnstone, Ralph, Am. aviator	Nov 17
Draper, William F., Am. diplomat-brig-gen	Jan 28	Jones, Alford M., Am. politician	July 10
Drummond, Sir George, Canadian Senator-banker	Feb 2	Jourdan, James, Am. maj-gen	Nov. 1
Dudley, Nathan A. M., Am. brig-gen	April 29	Kasson, John A., Am. diplomat-public official	May 18
Dumont, James A., Am. ex-supervising inspector-general of steam vessels	June 14	Kelly, Myra, (Mrs. Allan MacNaughtan), Am. author	March 31
Dunant, Jean Henri, Swiss author-humanitarian-founder International Red Cross Society	Oct 31	Kendall, Ezra, Am. actor	Jan. 24
Dunne, Rt. Rev. Edward J., Am. Roman Catholic bishop	Aug 5	Ketchel, Stanley, Am. champion middleweight boxer	Oct 15
Dyer, E. H., Am. agriculturalist	July 15	Keyes, Elisha W., Am. politician	Nov. 30
Dyer, Nehemiah Mays, Am. rear-admiral	Jan 27	Khiva, Kahn of, Said Mohammed	Aug 29
Ekert, Thomas T., Am. financier	Oct 20	Kierstedt, Andrew J., Am. rear-admiral	May 11
Eddy, Mrs. Mary Baker Glover, Am. founder Christian-Science Church	Dec 7	King, Adam E., Am. ex-consul-general at Paris	Nov 19
Edward VII, King of Great Britain and Ireland, Emperor of India	May 6	King, Edward, Eng. bishop of Lincoln	March 8
Edwards, Julian, Am. composer	Sept 5	Knaus, Ludwig, Ger. painter	Dec 7
Entwhistle, James N., Am. rear-admiral	March 23	Koch, Richard, Prussian financier	Oct 15
Erbsloeh, Oscar, Ger. inventor-aviator	July 13	Koch, Robert, Ger. medical scientist	May 27
Evans, Dudley, Am. financier	March 27	Lackland, Rufus J., Am. bank president	Feb 28
Everett, William, Am. scholar-philosopher	Feb. 16	LaFarge, John, Am. mural painter	Nov 14
Fahlberg, Charles, Ger. chemist-discoverer	Aug 16	Lamperti, Giovanni, It. singer	March 18
Faust, Lotta, Am. light opera singer	Jan 25	Landon, Melville DeLancy, Am. humorist-lecturer	Dec 16
Fedora, Princess of Schleswig-Holstein	June 21	Latham, Earl of, Eng. nobleman	March 10
Figuera, Jose M., Porto Rican jurist	Dec. 2	Lee, Henry, Am. actor	Nov 10
Finn, Daniel E., Am. politician	March 23	Letchworth, William Prior, Am. philanthropist	Dec. 2
Flower, Sarah M., Am. philanthropist	Aug 23	Lewis, Frank N., Am. physician	Nov 14
Foote, Wallace I., Jr., Am. statesman	Dec 17	Linney, Romulus Z., Am. statesman	April 16
Ford, Stephen Van Rensselaer, Am. author-composer-critic	June 5	Lovering, William C., Am. statesman	Feb 4
Forestier-Walker, General, Eng. Gov. of Gibraltar	Aug 31	Lowry, Robert, Am. brig-gen-ex gov. Mississippi	Jan 19
Foss, Rt. Rev. Cyrus David, Am. Meth-Episc bishop	Jan 29	Lueger, Karl, Austrian burgomaster Vienna	March 15
Poster, Mrs. Judith Ellen H., Am. lecturer	Aug 11	Lupton, Frank M., Am. publisher	Oct 5
Foulkrod, William Walter, Am. statesman	Nov 13	Macabee, William, Am. oldest Civil War survivor	Oct 6
Fowler, Frank, Am. painter-writer	Aug 28	Mace, James, Eng. ex-champion heavyweight boxer	Nov. 30
Fox, James D., Am. jurist	Oct 6	MacLagan, Rt. Rev. Dalrymple, Eng. Primate of England, former Archbishop of York	Sept 18
Freeman, Joel Francis, Am. financier	Nov 17	McCalla, Bowman Hendry, Am. rear-admiral	May 6
French, Samuel Gibbs, Am. Confederate maj-gen	April 20	McEnery, Samuel Douglas, Am. U. S. Senator ex-gov of Louisiana	June 28
French, Winsor B., Am. brig-gen	March 10	McGraw, John H., Am. ex-gov of Washington	June 23
Frermet, Emmanuel, Fr. sculptor	Sept 11	McGrew, James Clark, Am. statesman	Sept 18
Fuller, Melville W., Am. Chief Justice U. S. Sup. Ct.	July 4	McVicker, William Neilson, Am. Pros. Eps. bishop	June 28
		Magruder, David Lynn, Am. brig-gen	Nov 22
		Marocell, Ignacio, Mexican diplomat	April 16
		Marshall, James William, Am. ex-Cabinet official	Feb 5
		Martin James, Am. journalist	March 15
		Maschin, Colonel, Serbian revolutionist	April 1

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	Date of Death		Date of Death
Matzen, Henning, Danish statesman	July 18	Terrell, Edwin H., Am. ex-minister to Belgium	July 3
Mautegazza, Paul, It. anthropologist	Aug 28	Thompson, Albert C., Am. jurist	Jan 26
Mead, Larkin Goldsmith, Am. sculptor	Oct 15	Thorn, William K., Am. sportsman	Nov 16
Meade, Robert L., Am. brig-gen.	Feb 12	Tiernon, John Luke, Am. brig-gen	March 30
Mernitt, Wesley, Am. maj-gen.	Dec 3	Tirrell, Charles Q., Am. statesman	July 31
Meyer, Cord, Am. finan.	Oct 15	Tolstoy, Leo, Count, Russian author-reformer-philosopher	Nov 19
Mickey, John, Am. ex-gov. Neb.	June 2	Treat, Charles H., Am. ex-treasurer of U S	May 31
Mills, Darius Ogden, Am. finan.	Jan 3	Tree, Lambert, Am. diplomat-jurist	Oct 9
Monitt, Pedro, Chilean pres.	Aug 16	Treman, Henry E., Am. lawyer-brig-gen	Dec 9
Moody, William Vaughan, Am. playw-author	Oct 17	Truax, Charles H., Am. jurist	Jan 14
Morgan, Morris Hicky, Am. philologist	March 16	Turley, Thomas B., Am. ex-U S Senator	July 1
Munger, Theodore T., Am. theologian-author	Jan 12	Twombly, Hamilton McKay, Am. financier	Jan 11
Nabuco, Joachim, Brazilian Ambassador to U S	Jan 17	Van Cleave, James Wallace, Am. manufacturer	May 15
Nelidoff, Alexander Ivanovitch, Russian dip.	Sept 17	Vandal, Louis Jules Albert, Fr. Academician	Aug 30
Neville, Henry, Eng. actor-dram.	June 19	Van Lynden, Robert Melville, Baron, Dutch statesman	April 27
Newnes, Sir George, Eng. journalist	June 9	Veeder, William D., Am. statesman	Dec 2
Nightingale, Florence, Eng. pioneer nurse	Aug 13	Venable, Richard M., Am. lawyer	July 10
Niles, William H., Am. geologist.	Sept 13	Vezin, Hermann, Fr. actor	June 10
Oakes, James, Am. maj-gen.	Nov 27	Viardot-Garcia, Mme. Michelle Pauline, Fr. opera singer	May 18
Oates, William C., Am. ex-gov. Alabama	Sept 10	Vickers, Edwin, Am. oldest surviving Odd Fellow	Aug 24
Obaldia, Jose Domingo, Panama, president of	March 1	Vose, George Leonard, Am. educator	March 3
Ogilvie, John S., Am. publisher	Feb 10	Von Leyden, Ernst, Ger. physician-scientist	Oct 5
Orchardson, Sir William Quiller, Eng. painter	April 13	Wachter, Frank C., Am. statesman	July 1
Overstreet, Jesse, Am. statesman	May 27	Waldemar, Princess, Danish nobility	Dec 3
Paine, Robert Treat, Am. philanthropist	Aug 11	Walker, Edwin, Am. lawyer	Sept 3
Patterson, Edward, Am. jurist	Jan 28	Walsh, Thomas F., Am. capitalist	April 8
Patterson, Robert Wilson, Am. journalist	April 3	Walter, Arthur Frazer, Eng. journalist	Feb 22
Peak, John L., Am. diplomat	Sept 24	Ward, John Quincy Adams, Am. sculptor	May 1
Perkins, James Breck, Am. statesman	March 11	Ward, Leslie D., Am. financier	July 13
Platt, Thomas Collier, Am. ex-U S Senator	March 6	Warner, Adoniram, Am. statesman-soldier	Aug 13
Porter, Charles T., Am. mechanical-engineer	Aug 30	Warren, Samuel D., Am. manufacturer	Feb 21
Prior, William Sidney, (O Henry), Am. author	June 5	Webster, Sidney, Am. lawyer	May 30
Prior, Melton, Eng. journalist-artist	Nov 2	Werts, George F., Am. ex-gov. of New Jersey	Jan 17
Raabe, Wilhelm, Ger. author	Nov 15	Wetmore, Moses C., Am. manufacturer	Nov 26
Randolph, Wallace F., Am. maj-gen.	Dec 9	Weymouth, George W., Am. statesman	Sept 7
Rankin, David, Jr., Am. philanthropist	Aug 18	Wheelock, Joseph, Jr., Am. actor	Jan 22
Rassam, Hormuzd, Assyrian scholar	Sept 16	Whitman, Charles O., Am. educator	Dec 6
Rawson, Sir Harry Holdsworth, Eng. admiral	Nov 3	Whitteredge, Worthington, Am. painter	Feb 26
Read, John J., Am. rear-admiral	Oct 22	Whitney, Myron W., Am. singer	Sept 20
Reich, Emil, Ger. historian-geographer	Dec 11	Whitney, James L., Am. librarian	Sept 25
Rhoades, Lewis A., Am. educator	Aug 30	Wier, Levi C., Am. capitalist	March 28
Rhodes, Rufus Napoleon, Am. editor	June 12	Wiggins, L. Stone, Canadian scientist	Aug 14
Richards, William Rogers, Am. theologian	Jan 7	Williams, Juan, Chilean vice-admiral	June 25
Riddle, George, Am. lecturer-scholar	Nov 26	Williams, Rt. Rev. Channing M., Am. Prost Eps bishop	Dec 2
Ridgway, James W., Am. lawyer	July 28	Williams, George H., Am. ex-attorney-general of U S ex-U S Senator-jurist	April 4
Robe, Charles Franklin, Am. brig-gen.	July 2	Winans, Samuel Ross, Am. educator	July 25
Roberts, W. P., Am. brig-gen.	March 27	Wirschind, Alois, Am. inventor	July 14
Robertson, Beverly Holcombe, Am. conf. brig-gen	Nov 13	Wilson, Richard T., Am. banker	Nov 26
Rod, Edouard, Fr. author	Jan 29	Wolverton, Simon P., Am. statesman	Oct 25
Roelker, Charles R., Am. rear-admiral	Sept 28	Wood, Oliver E., Am. brig-gen.	Dec 4
Rolfe, William James, Am. edu. scholar	July 7	Woodward, James T., Am. banker	April 11
Rolls, Hon. Charles S., Eng. aviator	July 12	Wurtz, Henry, Am. chemist-scientist-author	Nov 10
Ronalds, George Lonillard, Am. financier	Oct 12	Wyatt, Julia, Am. actress	Nov 30
Rosser, Thomas L., Am. maj-gen.	March 29	Zabriske, Jeremiah Lott, Am. scientist	April 3
Rosster, Edward Van Wyck, Am. R R vice-pres	Dec 11		
Ruble, William A., Am. consul at Hong-Kong	April 15		
Rucker, Daniel H., Am. maj-gen.	Jan 6		
Rugg, the Rev. Dr. Henry W., Am. theologian-writer	July 21		
Sambourne, Lunley, Eng. cartoonist	Aug 3		
Sanford, Samuel S., Am. educator-musician	Jan 6		
Satoli, Francesco, It. Roman Catholic cardinal	Jan 8		
Saunmatelli, A. It. Rom. Cath. card.	Nov 24		
Savage, Mrs. Richard Henry, Am. lecturer-writer	July 7		
Schaefer, Jacob, Am. billiardist	March 8		
Schiaparelli, Giovanni, It. astronomer	July 5		
Scofield, Walter Keeler, Am. rear-admiral	Aug 5		
Scott, Harvey W., Am. journalist	Aug 7		
Scovel, Sylvester F., D.D. Am. theologian-hum.	Nov 29		
Scribner, Gilbert Hilton, Am. author-scientist	Jan 6		
Seekendorf, Count Goetzoon, Ger. diplomat	March 2		
Selgman, William, Am. banker	Jan 6		
Seward, George F., Am. financier	Nov 29		
Shepherd, James E., Am. jurist	Feb 7		
Silliman, Horace B., Am. philanthropist	May 4		
Simmons, Joseph Edwards, Am. banker	Aug 5		
Smith, Charles Sprague, Am. sociologist	March 30		
Smith, Goldwin, Canadian, publicist-historian-edu.	June 7		
Sone, Viscount Arasuke, Japanese statesman	Sept. 13		
Spencer, Earl of, Eng. statesman-cabinet-officer	Aug 13		
Spaeth, Rev. Dr. Adolph, Am. theologian	June 2		
Spellmeyer, Rev. Dr. Henry, Am. Meth-Episc bishop	March 12		
Stanley, W. E., Am. ex-gov. Kansas.	Oct. 13		
Stern, Isaac, Am. Merchant	Dec. 5		
Stevens, John Austin, Am. founder of the Sons of the Revolution author-historian	June 16		
Stolberg-Wernigerode, Count Udo von, Ger. president of the Reichstag	Feb 19		
Studley, John B., Am. actor	Aug 7		
Sully, Daniel, Am. actor	June 24		
Sumner, Alanson A., Am. capitalist.	Dec 3		
Sumner, William Graham, Am. educator	April 12		
Swope, John A., Am. statesman	Dec 6		
Talleyrand-Perigord, Charles William Frederick de, Fr. publicist	Feb 21		
Taylor, Robert W., Am. jurist	Nov. 25		
Taylor, Horace A., Am. public official.	Aug.		
Teck, Francis Joseph Leopold Frederick, Prince of Eng. nobleman	Oct. 22		

Negro Education. See NEGRO, THE.

Negro, The. The most significant development with regard to the position of the negro in the United States within five years has been the distinct tendency to take this question out of politics.

The negro is learning his independence as a citizen and political parties are making less appeal to racial prejudice. The prevalence of race riots has of late years diminished in a marked degree; lynchings are less frequent than formerly, and a better feeling exists on the part of both races. In 1907-08, what was known as the "prohibition wave," swept over the South, the leaders of this movement contending that to close the low saloons and drinking-places would remove one of the chief causes which incited ignorant negroes to crime. The first move in all cities having a large negro population, in case of public excitement of a racial kind is to close the saloons.

The steady industrial and commercial development of the South, by affording opportunity for intelligent negroes engaged in industry and trade, to become prosperous and to influence their own people toward industry and thrift, has had two definite results: it has reduced the tendency to irresponsible rioting, and it has tended to separate the races more and

more by building up among the better class of the colored people a prosperous social life of their own. The work of Booker Washington, of Tuskegee, of W. H. Council, of the Hampton Institute, and men of other practical schools and colleges, tends to supply leaders for such development. The statement has been made, and has never been contradicted, that no graduate of Tuskegee has ever been convicted of crime, and this is true or nearly true, of some of the less noted institutions. Negro crime is, as a rule, of the impulsive variety, and the negro who has had continuity of will and strength of character enough to educate himself, as the vast majority of educated negroes have done, is not likely to yield to the temptation to commit crimes of mere impulse, nor is there much inducement for him to commit crime of any other sort.

The recent tendency among negroes themselves is to build up a business life of their own, including banks, hospitals, hotels, restaurants, and other institutions, instead of mingling with the other race. Freedman's Hospital, in Washington, is managed entirely by negro physicians. Tuskegee has never had a white teacher or trustee. Not only are negro churches and their affairs naturally in the hands of clergymen of their own race, but there is in Baltimore an order of nuns, the Oblate Sisters, composed wholly of colored women.

In literature their tendency is nearly always to leave general topics alone and picture the life of their own race, and this is also true in music and acting. The so-called "rag-time" songs and dances of Ernest Hogan and Williams and Walker, like the songs of the Fisk Jubilee Singers, are based on genuine African motifs, and this is also true of the music of Will Marion Cook, who adds to a training gained in Paris and Berlin the ambition to develop the folk-music of his race; and of Harry Burleigh, who set to music several of Paul Laurence Dunbar's songs. Dunbar wrote some of the best dialect verse and fiction dealing with negro life, and was said by William Dean Howells to be the first American negro to view his race objectively. The stories of Charles D. Chestnutt and the verses of S. D. Corrothers show the same tendency. In the economic work of Booker Washington and others who have dealt with the race problem from a negro point of view there is the originality which comes of taking a practical, not a theoretical, view of the question, and solving it according to its own rules and not those formulated for a different race.

The development which has had as much to do with this attitude as any other one thing is the Tuskegee Conference, with the various other conferences and conventions of negro business men which have sprouted from this idea or developed independently. In these, all the successful negroes in their lines of business get together and compare notes. In the Tuskegee conference a negro plantation owner of Alabama began his speech by explaining that the suit of clothes he wore was homespun from his own sheep, and went on to say that during the past 12 months nothing had been purchased for the commissariat of his place except coffee. Everything else was grown on the plantation itself. Among plantation negroes there is said to be a growing distrust of the city, and a

tendency to prefer the independence and comfort of the country.

Here and there this has developed into a distinct negro settlement, of which the village of Mound Bayou, Mississippi, founded by Isaiah T. Montgomery, is (qv), the best known. In this colony are 8,000 negroes, and no white man can own a square foot of land. Montgomery, like Charles Banks, cashier of the bank of Mound Bayou, is a full-blooded negro. The system of crop-sharing does not exist here. The money of the people is spent at home and for their homes. One of the factors tending to hold back the plantation negro of the South has been the exploiting of his earnings by a low type of trader who runs a "cross-roads store" and sells bad liquor, cheap trinkets, and cheap luxuries. This trader was discouraged by the plantation owner before the war as a demoralizer of labor, but there has been no effective means of preventing him since the abolition of slavery. This type of man is kept out of Mound Bayou by law and sentiment. The village has some 50 stores, several churches, a Normal and Industrial Institute with 200 pupils and a Baptist college with as many. Of it the *Planters' Journal* of Memphis said: "They have worked out for themselves a better local government than any superior people has ever done for them in freedom."

Boley, Oklahoma, founded in Aug. 1903, is another negro town in which no white man owns land. One of its leading citizens was a prosperous negro of Texas, and several white men of prominence called upon him before he left and tried to persuade him not to go, urging that his influence was valuable where he was, and that they would back him. He replied, "I want to be where I can do a little leading, myself." This ambition doubtless has something to do with the success of these towns. Their founders desire, for themselves and their children, the satisfaction of a life in which they count not only as a supplement to the white man's plans, but in plans of their own.

Quite as significant is the development in business of the negro population of cities and their disposition to join with the best class of white leaders in furthering reforms in local conditions. Up to 1898 Jackson, Miss., had a population of about 50 per cent negro, owning little property; now there are 8,000 negroes, less than half the population, who own \$581,580 worth of property, about one-eleventh of the total valuation of the city's property, but one-third of its area. The first effort of the negro bank or loan associations is to induce the people to own their homes. In 1908 there were in the United States 27 negro banks, of which 11 were in Mississippi, 10 in Virginia, 5 in Oklahoma, 4 in Georgia, 4 in Texas, 4 in North Carolina, 2 in Alabama, 1 in Arkansas, 1 in Pennsylvania and 1 in Illinois. Such a bank often accepts its own stock as cash payment on real estate. The real estate held by colored people in Chicago amounts to about \$4,000,000. In Alabama, the Penny Savings and Loan Company had, when founded in 1890, a capital of \$3,555; in 1909 it had a paid-in capital of \$25,000, a surplus of \$6,000, and deposits of \$193,000, and owns real estate amounting to \$25,000 in its building and \$52,000 elsewhere. The negro population has theatres of its own in Chicago, New Orleans, Jackson, Memphis, Atlanta,

NEGRO

Columbus, Jacksonville, Yazoo City, Baton Rouge, and Plaquemine. The National Baptist Publishing Company owns \$350,000 worth of property in Nashville.

In North Carolina in 1908 the property owned by negroes amounted to \$21,716,922, an increase of 171 per cent in 17 years. In Georgia, in 1907, they owned \$25,904,822 worth, an increase of 82 per cent in 16 years. Statistics as to the amount of property owned by negroes in the United States are as yet very incomplete. The success obtained by them in the management of business enterprises like banks has additional significance because of the fact that no negro can learn such management, as clerk in a business already established. He has to get his business experience independently of the accumulated wisdom of the other race, a handicap under which no other alien works. Moreover, for many years after the war he could not obtain practical education even in schools established for him. Within the last 10 years the men trained in practical schools and the men who have learned what they know by the experience of practical life have begun to forge to the front, and this may account for the seemingly phenomenal increase in the capital and prosperity of the race.

It is significant also that instead of negro schools being supported by white contributions they are largely and often entirely supported by the money of negroes. The negro Baptists own 120 schools with 613 teachers and 18,644 students, and the collections for the schools in one year amounted to \$97,032.75. The A. M. E. churches gave \$51,000 for education in the year 1907, and twice as much more was collected by the schools from students' fees. The A. M. E. Zion churches raised \$100,000 for schools in one year. The gifts of Col. John McKee, of Philadelphia, and of Thomy Lafon, of New Orleans, negro philanthropists, to Catholic schools and other institutions reached the sum of \$1,000,000 or more. The public schools for negroes are more than supported in the imperfect form in which they often exist by the taxes which negroes pay.

There are 1,960 Masonic lodges of negroes with 45,835 members, the first having been organized 6 May 1787. Negro Masons formed part of the funeral procession of Washington. The Odd Fellows number 4,643 lodges with 285,931 members. There are in the United States 1,734 negro physicians and surgeons, among the most noted being Dr. Daniel H. Williams; Dr. George E. Hall, Dr. A. M. Curtis; and their National Medical Association has 350 members. There are 728 negro lawyers, 210 journalists, and 136 druggists. The Taylor-Lane Hospital at Orangeburg, S. C., was founded by a colored woman physician, Dr. Matilda A. Evans.

It is estimated that negro farmers own in the South 30,000 square miles of land, and that the negroes in the United States own \$550,000,000 of taxable property. Before the war they owned something like \$25,000,000. Alfred Smith, known as the Cotton King of Oklahoma, has taken the prize for his cotton in Liverpool, and in 1900 gained the first prize at the Paris exhibition. One Alabama farmer who owns only two acres of land raises upon it four bales of cotton a year besides grain and fodder, the

average yield of cotton per acre in Alabama being a little more than one-third of a bale.

In the matter of crime there have been some significant changes in the past few years. In 1908 Georgia abolished the convict camps. Judge N. B. Feagin, of Alabama, was the first to agitate the question of a probation officer for colored boys in 1907. Up to that time all colored boys arrested were sent to the chain-gang or penitentiary, there being no reform school for them. Judge Feagin stated that if the negro churches and citizens could raise enough money to support a probation officer he would sentence such young offenders to the care of this officer. This was done, and followed up by the establishment of a probation farm near Birmingham on which there are now about 100 boys. Thus the court avoids placing the street boy where he will be closely associated for years with the most degraded criminals of both races.

After the "Atlanta Riots" of 22 Sept. 1906, ex-governor W. J. Northen and Charles T. Hopkins set on foot a league for the purpose of putting down mob violence, and there have since been organized more than 80 such leagues in Georgia and other States.

Comparative statistics show that in 1904 the negroes of the United States numbered 8,840,789; the number committed for all crimes in that year was 23,628, the number committed was thus 27 per thousand. The criminal statistics show that among Italians the ratio was 4.4 per 1,000, Mexicans 4.7, Canadians 3, Russians 2.8. Regarding the crime of rape, of which the negro has been rather violently accused, statistics show commitments among negroes for this crime to be 18 per 100,000 of the population as against 5.3 among Italians, 4.8 among Mexicans, 3.2 among Austrians, 2 among Hungarians, 1.9 among French, 1.9 among Russians, 0.4 among Germans, and 0.3 among Irish. The *Chicago Tribune's* statistics show that this crime according to criminal records was about 12 times as common in Chicago as in the Black Belt. It would seem that when recorded facts are compared, this crime exists, like most others, roughly in proportion to the advance which any alien colony has made in civilization and intelligent living, under uncrowded and humane conditions.

The achievements of individual negroes are often unduly emphasized by reason of their race, but there are a few who may claim to have won recognition simply as Americans. Henry O. Tanner, a son of Bishop Tanner, won the third Salon medal in 1896 with his picture of "Lazarus," which was bought by the French Government for the Luxembourg. Thomas Greene Bethune, better known as "Blind Tom" died on 3 July 1908, nearly 60 years old, after a remarkable career as a pianist and composer of native genius without any training. The companion of Peary on his polar expeditions, Matt Henson, a Virginia negro, accompanied him practically to the Pole. The present champion heavyweight of the world is a negro, John A. Johnson. These individual instances of ability in various directions are less valuable than statistics showing the condition of the mass of the race and the progress which it makes. They are valuable chiefly in connection with the fact that in each case the negro has done something which it was said no negro

could do, and thus proved the fallacy of negative prophecy of this kind. The facts which affect the country at large are the owning of homes and other property by negroes, their ability to conduct successfully their own affairs, and their cooperation with their white neighbors in the interests of law and order.

The National Association for the Advancement of Colored People issued, in Nov. 1910, a circular headed "An Appeal to England and Europe." The circular says in part: "The undersigned Negro-Americans have heard, with great regret, the recent attempt to assure England and Europe that their condition in America is satisfactory. They sincerely wish that such were the case, but it becomes their plain duty to say that if Booker T. Washington or any other person in giving the impression abroad that the negro problem in America is in process of satisfactory solution, he is giving an impression which is not true. We say this without personal bitterness toward Mr. Washington. He is a distinguished American and has a perfect right to his opinions. But we are compelled to point out that Mr. Washington's large financial responsibilities have made him dependent on the rich charitable public and that for this reason he has for years been compelled to tell, not the whole truth, but that part of it which certain powerful interests in America wish to appear as the whole truth.

"In flat contradiction, however, to the pleasant pictures thus pointed out, let us not forget that the consensus of opinion among eminent European scholars who know the race problem in America, from De Tocqueville down to Von Halle, De Laveleys, Archer, and Johnson, is that it forms the gravest of American problems. We black men who live and suffer under present conditions, and who have no reason, and refuse to accept reasons, for silence, can substantiate this unanimous testimony. Our people were emancipated in a whirl of passion and then left naked to the mercies of their enraged and impoverished ex-masters. As our sole means of defense we were given the ballot, and we used it so as to secure the real fruits of the war. Without it we would have returned to slavery; with it we struggled toward freedom. No sooner, however, had we rid ourselves of nearly two-thirds of our illiteracy, and accumulated \$600,000,000 worth of property in a generation, than this ballot, which had become increasingly necessary to the defense of our civil and property rights, was taken from us by force and fraud."

A convention of negroes in Oklahoma has adopted the following resolutions, which are reported to be the beginning of a national movement, which will have organization in the East as well as in the South: "Whereas, the colored race of Oklahoma, consisting of 15 or 20 per cent of the entire population of this State, have loyally supported the Republican party and its principles, and, with the exception of the Hon. Joe McNeal and the Hon. Bird McGuire, have never received any social or political recognition from the Republicans; therefore, be it resolved, that we hereby indorse the platform put out by our Socialist brothers and recommend that all the colored people of Oklahoma vote the Socialist ticket."

Education—The measure of progress which has been made in public opinion and in the

educational status of the negro race in the Middle and New England States can easily be estimated by the fact that as recently as 1830 no Negro could matriculate in any of the colleges and other schools of this splendid group of States, and that now not one of them is closed against a black person, except Girard College at Philadelphia, whose founder made a perpetual discrimination against people of African descent in devising his benefaction; that negro children stand on the same footing with white children in all public schools benefits; that the separate school system has broken down entirely in the New England States and is gradually breaking down in the Middle States.

In 1856 Wilberforce University, for colored people was founded in Ohio by the Methodist-Episcopal Church. It now has a teaching staff of thirty and over three hundred students. The close of the Civil War found the Southern States eager and willing to take up the problem of educating the freed race. Social prejudice did not permit their introduction into the schools for white children, but over \$150,000,000 have already been spent in the South in maintaining separate schools for the negroes. The people of the New England and Middle States in the beginning sent a voluntary gift of over \$40,000,000 to plant common schools, academies and colleges in the South. Prominent in the organization of negro education, were the American Missionary Association, under whose auspices many institutions were opened and the Freedmen's Bureau organized 1865, which in five years established more than 2,000 schools, supported 3,000 teachers, and instructed 150,000 children. In 1870 the Bureau turned its work over to the American Missionary Association, together with a large sum of money which was expended on buildings at Hampton, Charleston, Nashville, New Orleans, and other places. Protestant denominations in the North soon joined in the work. The Freedman's Aid Society of the Methodist-Episcopal Church has founded and supported about 25 educational institutions, including Clark University and Gammon Theological Seminary at Atlanta. The Home Mission Society of the Baptist Church has established more than 15 schools of academic and collegiate grade including the well-known Spellman Institute of Atlanta. The Episcopalians, Presbyterians and Friends, have organized a smaller number of schools, but most of them are of high character and include normal and industrial schools and theological seminaries as well as primary institutions. The benevolence of single individuals has also contributed greatly to the cause of negro education in the South. The most influential fund was that of George Peabody who in 1867 and 1869 donated \$2,000,000 in all for the promotion of education in the Southern States. The interest of the same has been distributed to schools for negroes as well as those for whites. In March 1882 John Fox Slater, of Norwich, Conn., created a trust formed for the education of negroes. This is administered by a trustee board and is used almost exclusively in promoting industrial education at a number of the largest institutions for colored people. Daniel Hand, of Guilford, Conn., in 1888 gave the American Missionary Association over \$1,000,000 which, with provision for residuary estate of over \$500,000, was to be devoted to educating needy

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and indigent negroes. As the outgrowth of these and other benefactions since 1865, there are now not far from 200 schools of secondary and higher education in the Southern States maintained for the negro people. They are fed constantly from the common schools. Some of them are magnificent seats of learning, as for example Howard University at Washington, Atlanta University at Atlanta, Fish University at Nashville, Wiley University at Marshall, Texas. Besides these, most of the Southern States maintain public normal schools for negroes and a private normal school. The institute for colored youth under Quaker control is located at Cheney, Pa. It must not be forgotten that all the Colleges and Universities of the Northern and Western States are accessible to negro students. Berea College, Kentucky, devoted to the educational needs of both the negroes and whites in the mountain districts, was recently compelled by State legislation to dismiss its colored students. The American Missionary Association, which in 1881 passed to the control of the Congregational Church, has remained the most prominent society in its undertakings for the cause of negro education. At present it maintains eight schools of academic or collegiate grade, including Howard University, Hampton Institute, and Atlanta University, about 30 normal schools and over 60 industrial and primary schools.

The Hampton Normal and Agricultural Institute at Hampton, Va., in the above list of the American Missionary Associations' enterprises, deserves special mention as it is without doubt at the present time the centre of all that is best, wisest and most permanent in the educational development of the negro in the South. Its foundation was the work of Gen. Samuel Chapman Armstrong, who began in 1868 with two teachers and fifteen students, in an old barracks left by the Civil War. It now has nearly 100 teachers and nearly 1,400 students. It is the largest and most important seat of learning in the country for the development of the negro. It has a large property valued at nearly \$1,000,000 and has in constant operation all the industries by which the colored people find it necessary to make a living. Under wise supervision this institution is constantly growing, broadening and deepening its influence among the people.

The work of the Hampton Institute has not only resulted in turning the attention of the negro population to the importance of industrial education, but has had a marked influence in shaping the education of the white South in the same direction. Out of the Hampton Institute grew the Tuskegee Normal and Industrial Institute, located at Tuskegee, Ala., in the black belt of the South. The Tuskegee Institute has grown from a log cabin to an institution possessing at the present time (1910) 62 buildings with 2,325 acres of land, 151 instructors, and over 1,500 students. It gives instruction in about 36 different industries, in addition to giving training in academic and religious branches. A large number of graduates of Tuskegee are turned out every year and are at work in various portions of the South as teachers in class rooms, instructors in agricultural, mechanical and domestic pursuits. Quite a number of these graduates and students cultivate their own farms or man their own indus-

trial establishments. The property owned by the Tuskegee Normal and Industrial Institute is valued at \$700,000, and the buildings have been very largely built by the labor of the students themselves. One rather unique feature of the Tuskegee Normal and Industrial Institute is that the Institution is wholly officered by members of the negro race. Aside from Hampton, Tuskegee is one of the largest and most important centres of education in the South, especially in the direction of industrial development. The work of the Hampton Institute and Tuskegee is not only proving itself valuable in showing the rank and file of the colored people how to lift themselves up, but it is equally important in winning the friendship and cooperation of the Southern white people. The influence of the young men and women turned out from these two institutions, as well as from other institutions, is gradually softening the prejudice against the education of the negro, and in many striking instances bringing about the active cooperation and help of the Southern white man in the direction of elevating the negro to a higher plane of living.

There have been many other schools than the Tuskegee Institute founded on the Hampton idea, and the number is increasing every year. Nearly all the Southern States are now maintaining industrial schools not only for the blacks but for the whites as well.

Nelson, Knute, American politician. b on a farm in Norway, 2 Feb. 1843. He came to America with his mother in 1849 and after a boyhood of poverty he managed to spend several years at Albion College, and, after the war, when he was wounded, he was admitted to the bar, 1867. The next year he went to Wisconsin, and, several years later to Minnesota. In the former State he was a member of the Wisconsin House of Representatives, 1868-69. In Minnesota he was county attorney of Douglas County, 1872-74; member of the Minnesota Senate, 1875-78; member of the 48th to 50th Congresses, 1883-89; governor of Minnesota 1892-94 and 1894-96. He has been United States Senator from Minnesota continuously since 1895, being reelected for his third term in 1907.

Nelson, Richard Henry, coadjutor P. E. bishop of Albany and 218th in succession in the American episcopate: b. New York City, 10 Nov. 1859. He was graduated from Trinity College, Hartford, Conn., A.B. 1880, A.M. 1883, attended the University of Leipzig 1880-81, and was graduated from Berkeley Divinity School in 1883. He was ordered deacon in 1883, ordained priest the following year and was assistant at St. John's church Stamford, Conn., 1883-84; rector of Grace Church, Waterville, N. Y., 1884-87; of Christ Church, Norwich, Conn., 1887-97, and of St. Peter's Church, Phila., 1897-1904. He was elected coadjutor to the Rt. Rev. William Crowell Doane, bishop of the diocese of Albany, and was consecrated 19 May 1904, the bishops of Albany, Pennsylvania, and Western New York acting as consecrators, assisted by the bishops of Connecticut, Long Island, and New York. The honorary degree of D.D. was conferred on him by Trinity College and by Berkeley Divinity School in 1904, and that of S.T.D. by the University of Pennsylvania the same year.

NEON — NETHERLANDS

Neon. The gaseous element neon, which was discovered by Sir William Ramsay, is remarkable for chemical inertness, but possesses a curious physical property recently discovered by J Norman Collie. When a sealed glass tube, containing mercury at an atmosphere of neon at low pressure, is shaken it becomes strongly luminous. Similar effects are obtained when other gases are substituted for neon, but the light emitted by neon under these conditions is especially bright. If the shaking is repeated during intervals through two or three hours, the intensity of light diminishes for a time and thereafter remains constant. The original luminosity can be restored by passing an electric discharge through the tube. If one end of the tube is heated to 750°F. while the other is cooled by immersion in liquid air, and the tube is then allowed to return to the ordinary atmospheric temperature, the part which had been heated glows much more brightly than before. The luminosity is also greatly increased by substituting a tube of fused quartz for the glass tube. G. Claude is endeavoring to utilize this remarkable property of neon as a source of light, and claims to have constructed neon lamps of an efficiency equal to about 1 watt per candle-power.

Nepal. A petty kingdom of India, lying in the Himalayan Mountains, bounded by British India, Tibet, and Sikkim. The country is 500 miles long and 100 wide; area 54,000 square miles. The population is estimated at 4,000,000. The capital city, Katmandu, has about 50,000 inhabitants. Other towns are Bhatgaon, Birganj, Palpa, and Bhimphed, at each of which there are hospitals. The religion of the aboriginal tribes is Mohammedanism, but Hinduism is spreading rapidly. The nominal sovereign is a native Potentate of 11 titles, but the reins of authority are in the hands of the Prime Minister, who is also a General in the British army. A British official resides at the capital, (since the treaty of Segowhie, 1815,) but does not interfere with the internal administration. Foreign affairs are regulated by the British Government in India. The revenue amounts to almost \$5,000,000 annually. It is derived from land rents, forests, customs, etc. The principal products of the country are opium, gums, resins and dyes, jute, wheat, pulse, rice and other grains, butter, oil, seeds, spices, tobacco, timber, etc.—all of which are exported. Other exports are hides and skins, cattle, saltpetre, and drugs. The leading imports into Nepal are cattle, and other live stock, salt, spices, sugar, tobacco, petroleum, leather, brass, iron and copper wares, cotton, yarn, silk, etc. The total imports from British India in 1909-10 were valued at \$5,245,500, and the exports to that country at \$10,680,000. Wild animals abound in the jungles of Nepal.

Netherlands, The. The Netherlands is a small kingdom in northwestern Europe, at one time allied under this name with Belgium. The Belgian revolution of 1830 dissolved this union, and Holland and its adjacent provinces have since formed an independent kingdom. While the House of Orange, the royal family of the Netherlands, descends from a German Count Walram of the 11th century, the people of Holland are, like the Flemish, of Low-German race, but of distinct racial traditions and language. Their language resembles certain Corn-

wall dialects so closely that it is said that Dutch sailors shipwrecked in Cornwall made themselves understood by the natives without any difficulty. The great era of Holland was in the days of the Dutch East India Company. Her colonies now comprise Java, Sumatra, Borneo, and Celebes in the East Indies, Curaçao, in the West Indies, and Dutch Guiana in South America.

Area and Population.—The population of Holland has more than doubled since 1830. The area and population of the various provinces are as follows (1908):

Province	Area	Population	Per Square mile
North Brabant	1,980	620,101	313
Guelanders	1,965	639,431	325
South Holland	1,166	1,303,277	1,168
North Holland	1,070	1,103,514	1,031
Zealand	690	231,958	336
Utrecht	534	285,490	534
Friesland	1,282	362,912	283
Overijssel	1,291	379,834	294
Groningen	790	331,213	419
Drenthe	1,030	172,892	167
Limburch	850	334,586	393
Total	12,648	5,825,198 (av)	400

The rate of increase in 1908 was 1.36. At the census of 1899 there were 52,625 persons of foreign birth living in the Netherlands, three-fifths of them being Germans. The emigration has been mostly to North America; in 1908 it was 3,030. There is a considerable colony of Hollanders in New York, where they usually find employment easily in importing houses, because of their good education and linguistic ability. Holland has 24 cities of over 20,000 population, 11 of more than 50,000 population, and four of more than 100,000—Amsterdam, with 565,589 inhabitants, Rotterdam with 411,635, The Hague with 259,012, and Utrecht with 110,783.

The land is often below sea level, the sea being kept out by dykes, and there is a network of canals. The soft, moist air makes it a wonderful country for agriculture, gardens, and dairies.

Government.—The first constitution of the Netherlands after its reconstruction as a kingdom was given in 1815 and revised in 1848 and 1887, and according to this, the country is a constitutional and hereditary monarchy. The crown passes in the order of primogeniture, in the direct male line; in default of male heirs the female line ascends the throne, and if there be no legal heir the successor to the throne is designated by the sovereign and a joint meeting of Parliament (each House containing twice the usual number of members), or by Parliament alone if the case occurs after the death of the sovereign. The sovereign comes of age at 18 years.

The present ruler is Queen Wilhelmina Helena Pauline Maria, born 31 Aug 1880, who succeeded her father, the late King Willem III, 23 Nov. 1890, and was inaugurated 6 Sept. 1898, her mother, Queen Emma, daughter of Prince George Victor, of Waldeck, having been regent during the Queen's minority. Queen Wilhelmina was married to Prince Henry of Mecklenburg-Schwerin, 7 Feb 1909. The only child and heirress to the throne is Princess Juliana Louise Emma Maria Wilhelmina, born 30 April 1909. The Sovereign has a civil list of 600,000 guilders; there is a large revenue

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from domains, and an allowance of 50,000 guilders for the maintenance of the royal palaces; the family of Orange has besides a large private fortune acquired mainly by King Willem I in the prosecution of vast enterprises pertaining to the commerce of the Netherlands.

The executive power of the State belongs exclusively to the Sovereign, and the legislative power rests conjointly in the Sovereign and the Parliament, or States-General. The Upper Chamber is composed of 50 members elected by the Provincial States from among the most highly assessed inhabitants of the provinces or from certain functionaries mentioned by law. The Second Chamber numbers 100 deputies elected directly. The Ministry consists of the Ministers of the Interior, Foreign Affairs, Finance, Justice, the Colonies, Marine, War, Public Works, and Agriculture, Commerce and Industry. The State Council or Raad van State, appointed by the Sovereign, of which the Sovereign is president, consists of 14 members, and is consulted on all legislative and many executive questions.

Each province has its own representative body, called "The Provincial States," the members being elected for six years. Each of the 1,123 communes forms a Corporation with its own interests and rights.

Finance.—The budget estimates for 1910 were, total revenue, 188,326,473 guilders; expenditure in toto, 207,187,206 guilders. The amount of the chief taxes per head of the population was, in 1908, 23.75. This estimate does not include a separate budget for the great colonial possessions, voted upon by the States-General. The total national debt in 1910 was 1,122,433,750 guilders, annual interest 36,309,256 guilders. The total wealth of the Netherlands, real and personal, has been estimated at \$4,400,000,000. In 1908 the taxable annual value of buildings was given at 157,340,900 guilders and of land 97,059,950 guilders. The various provinces and communes have their own separate budgets.

Army.—See ARMIES OF THE WORLD

Navy.—See NAVIES OF THE WORLD

Education and Religion.—By the Act of 1887 public instruction was diminished and a greater share in education left to private schools, supported by the State; public instruction (primary) is given in all places where needed; the school age is from 6 to 13.

The Universities of Leyden, Utrecht, Groningen, and Amsterdam have 300 professors and 3,475 students in all. There is one technical university with 1,243 students. The classical schools number 30, with 2,108 students; schools for the working people 302, with 31,375 students; navigation schools, 11, with 852 students; there are 89 middle class schools with 14,071 pupils; 3,274 public elementary schools with 563,187 pupils, 1,885 private elementary schools with 316,088 pupils; 160 public infant schools with 28,032 pupils and 1,025 private infant schools with 97,819 pupils. Of the total number of children of school age in 1908 about 5 per cent received no elementary instruction. Besides the schools already named there are a great many special schools. In 1907 the State spent on instruction £1,960,166, and the Communes £1,035,916. In 1908, 1.6 per cent of the conscripts called out could not read or write; in 1875 the percentage was over 12 per cent.

Complete social equality and religious liberty are granted to all. The royal family and most of the people belong to the Reformed Church. The State Budget allows for Protestant churches about 1,375,000 guilders, for Roman Catholics 580,000, and for Jews about 14,000.

Agriculture.—The surface of the country was divided in hectares (1 hectare equals 2.47 acres), in 1908 as follows: Uncultivated land (heath), 556,190; water and morass, 124,200; dykes and roads, 52,633; untaxed land, 78,309; building land, houses, etc., 47,206; arable land, 862,740; pasture, 1,204,433; gardens and orchards, 74,575; forest, 259,446. The area of cultivated land is nearly three times that of the uncultivated. In Zealand, South Holland, Groningen, and North Holland large estates prevail; in North Brabant, Guelders, Limburg, and Overijssel small estates are the rule.

The areas under the principal crops, and their yield per hectare, in 1908, were as follows:

Crop	Hectares	Hecto- litres
Wheat.....	56,269	32.1
Rye.....	222,201	25.2
Winter barley.....	23,440	48.9
Summer barley.....	6,378	37.7
Oats.....	139,827	49.6
Potatoes.....	159,887	213.0
Buckwheat.....	16,585	19.4
Beans.....	27,846	30.2
Peas.....	29,063	25.4
Rape seed.....	3,384	30.8
Flax.....	14,394	620.0
Beets.....	47,753	32,725.0
Carrot-like plants for forage.....	33,399	

Bulbs of every kind flourish in gardens, and spring bulbs, shrubs, and trees form an important export. In 1908, 5,356 vessels of all kinds were engaged in the fisheries with crews numbering about 20,502, and the product of the herring fishery in the North Sea amounted to 8,159,050 guilders, and the oysters to 2,131,257 kilos.

Exports and Imports.—The Netherlands is a free trading country. The value of the leading imports and exports in 1908 were as follows:

Products	Imports (1,000 guilders)	Exports (1,000 guilders)
Iron and steel.....	314,618	211,201
Textiles.....	156,422	118,263
Cereals and flour.....	395,128	239,959
Coal.....	81,350	21,388
Rice.....	89,709	47,462
Sugar.....	23,303	59,342
Wood.....	109,167	74,183
Copper.....	166,926	142,697

The total imports for 1908 were estimated at 37,720,000,000 kilogrammes, and the exports 26,865,000, about six times what they were in 1872. In 1908 the percentage of trade with the leading countries was as follows.

Country	Percentage import	Percentage export
Prussia.....	22.4	47
Great Britain.....	10.5	22.5
Belgium.....	9.6	12.9
Dutch East Indies.....	14.3	4.1
Russia.....	9.9	0.6
British India.....	2.6	....
France.....	1.2	0.7
Hamburg.....	1.6	2.5
Italy.....	....	0.7

In 1908 the import of bulbs, shrubs, and trees was valued at 1,805,000 guilders, and the export at 12,621,000.

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Shipping—The total number of vessels which entered Dutch ports in 1908 was 13,801, with tonnage of 13,034,988. Of these 3,991 were Dutch vessels. The vessels with cargoes were divided among the chief ports as follows: Rotterdam, entered, 66.5 per cent, cleared, 49.7 per cent; Amsterdam, entered, 15.3 per cent; cleared, 17.9 per cent; Flushing, entered, 5.4 per cent, cleared, 9.6 per cent. The number of Dutch vessels engaged in the carrying trade between foreign ports was 3,931; the coasting trade is of little importance.

Manufactures and Minerals.—In 1908 there were 529 distilleries, 11 sugar refineries, 27 beet sugar refineries, 35 salt works, 449 breweries, and 74 vinegar manufactories.

A few coal mines are in the province of Limburg, and most of them belong to the State; they produced, in 1908, 908,201 metric tons valued at 6,071,000 guilders, of which the clear revenue of the State mines was 190,911 guilders.

Communications.—There are some 1,900 miles of canals, and 2,940 miles of roads in the Netherlands. In 1907 the total length of the tramway lines was 1,350 miles, 130,747,000 passengers were carried and 1,077,566,000 kilogrammes of goods; the revenue amounted to 11,886,000 guilders. In 1908 there were 1,908 miles of railways, the number of passengers carried was 42,005,000, the goods amounted to 15,479,000,000 kilogrammes; the revenue was 55,940,000 guilders and the expenditure 49,239,000 guilders. All railway companies are private.

In 1908 the average number of letters and post cards per inhabitant was 41.9; the receipts of the postoffices were 14,420,000 guilders, and the expenditure 11,771,000 guilders.

There are several private telegraph lines, but most of the lines are owned by the State. In 1909 the length of State lines was 4,553 miles and the number of offices 959; number of paid messages in 1908, 5,942,500. The receipts of the State in that year were 2,369,000 guilders, and the ordinary expenses 3,877,000 guilders. The interurban telephone system had 1,798 miles of line; the receipts were 896,000 guilders, and the total expenses 1,171,000 guilders.

Social Conditions.—The relief of the poor is mainly effected by the religious societies and organized private charity; when these fail the pauper must be supported by the commune where he is living. There is no poor rate in the Netherlands, and workhouses for the poor are found in very few places. The beggar and vagabond if convicted can be placed in a State-work establishment.

The total number of inmates in the prisons during 1907 was 9,354 males and 594 females; in the houses of detention 25,965 males and 1,624 females. In the State-work establishments the number of inmates was 5,894 males and 139 females. There are four State reformatories, and 874 boys and 86 girls were in these institutions in 1907. In 1904 an act was passed establishing disciplinary schools for the education of neglected children. The State police consist of field constables and about 950 cavalry to guard the frontiers; and each commune has also its own police force.

The people of Holland are among the thriftiest in Europe, making the most of all their resources, and owing to this general habit, comfort is attainable on a very small income. The

Hollanders were among the first people in Europe to substitute waxed floors and Oriental carpets for rush-covered or earth floors such as were common in England, and, partly owing to the trade with the East Indies and partly to the cleverness of the people in various kinds of handicraft, an effect of luxury is found often in homes of very moderate means. In brass-work especially the Hollander yields to none, and the porcelains of Delft are famous.

A feature of street life in Dutch cities illustrates the economical ways of the poorer folk, here and there will be found a shop where fire is sold—buckets filled with smoldering peat or coals are carried home by people too poor to keep a fire all day, and over this fire they cook their midday meal. Hot water is also sold at these shops, and cooked food of various kinds can be bought cheap. The scrupulous cleanliness of the Dutch home has become a proverb. In winter the canals cheapen transportation nearly as much as in the summer, for the people go everywhere on skates, and take their produce to market on sledges. The market-people use dogs as draught animals both in the Netherlands and in Belgium, and a special kind of dog is bred to harness. As every one knows, windmills are to be seen everywhere, and the Hollanders generally have mastered the art of getting power for their industries as inexpensively as possible, and profiting, by their very limitations and disadvantages.

History, 1910.—A peculiar situation has been created in Holland by the plan of that country to spend some \$16,500,000 on her defensive system, particularly on fortifications at the mouth of the River Scheldt. The resignation of the war Minister, General Cool, in 1910, was regarded as an indication that the fortification bill would be withdrawn, or at any rate remodelled. If it is not remodelled at least, Belgium's uneasiness will be increased, because the proposed fortification would tend to isolate Antwerp in the case of an Anglo-German war.

Holland herself tends to be jealous of German influence and not to like it much, and it will be remembered that some dissatisfaction was expressed when the Queen married a German prince. It is pointed out by observers in and out of Holland that Germany has for years been making preparations of a military kind, on her Luxembourg, Belgian, and Dutch frontiers, and in case of a war with England the Flushing fortifications would probably be an excellent naval base for Germany. It is also argued that England has no reason to advise such a fortification, because in case of invasion of the Continent her armies could easily land on the French coast. In short, Holland and the anti-German forces of Europe generally are puzzled and disquieted by this action of the Dutch Government. Additional reason for wonderment lies in the fact that the inundation line, on which the safety of Holland depends if attacked from the east, is not receiving even as much attention as usual.

Commercially the record of 1909 and 1910 has been as prosperous as usual, although the increased cost of living is felt even in thrifty Holland. Municipal expenses have been rather more than usual. A Palace of Peace is under construction at The Hague, of which Holland is justly proud.

Another matter in which German action is

resented is the proposed reimposition of the Rhine navigation duties, by that country.

The development of Dutch colonies is being energetically pushed, and the cultivation of rubber in Java has become important. About £15,000,000 are said to be invested in such properties, two-thirds of it supplied by British capitalists. Speculation on the Bourse has been rather heavy, for along with the solidity and practicality of the Dutch nature there exists a curious gambling proclivity, which, in the case of colonial and mercantile enterprise, shows itself in the kind of daring which risks much to gain much. The system of the Dutch Bourse, by making it impossible to deal for future periods, prevents the accumulation of weak positions, and thus restricts the ill effects of speculation.

Dutch business men are ready to adopt American methods wherever they see profit in it, and there has been some talk of a department store in Amsterdam on the American plan.

The Dutch bulb growers form a part of Dutch industry and trade, quite by themselves. They are organized into a federation with nearly 3,000 members and divided into 37 local groups. The cultivation and export of bulbs have been carried on since 1750, and the country, naturally fitted for it, is often further prepared at great cost for growing choice bulbs.

Neurology. The recent opening of the Neurological Institute, in New York, marks an event in medical science; for here is the first Medical Institute that has ever been opened in which drugs are not to be administered. Water treatment, electricity, and a few simple remedies of the kind will be all that are allowed in the way of physical remedies; the bulk of the treatment will consist in suggestion, and various mental methods of treatment,—lately made prominent and popularized by the Christian Science movement, the Emanuel Church movement, and various cults of the kind. The new Institute, however, is not to be conducted on any lines not acknowledged or recognized by medical science; but all the latest and most approved methods of psychotherapy, as developed in this country and in Europe, will be utilized. The trustees of the new Institute are: Richard H. Williams, president; Robert P. Perkins, secretary; Otto H. Kahn, treasurer; and Isaac Townsend, Paul Warburg, Adrian Iselin, Jr., Charles Steele, Dr. Edward T. Devine, of the Charity Organization Society, George G. Haven, Jr., and George G. Frelinghuysen.

Dr. Joseph Collins, who has devoted much time and energy to the planning of the Institute, is at the head of the medical board, and is chief of staff; and his fellow members of the board are,—Dr. Pearce Bailey, and Dr. Joseph Fränkel. The assistant physicians are Dr. Smith Ely Jelliffe, Dr. M. Grosse, Dr. Augustine A. Wolfe, and Dr. D. M. Kaplan. The consulting physicians are Dr. Charles L. Dana, Francis P. Kinnicutt, Herman M. Biggs, and Bernard Sachs. Dr. George G. Taylor is house physician, and Miss Esther Brown, formerly of the Presbyterian Hospital, superintendent.

A "suggestion-room" is provided in the hospital, in which are numerous delicate instruments, capable of measuring the state of the nerves and the emotions. Here experiments will doubtless be made in psycho-analysis, and it is hoped that much benefit may be derived

and much information gained by a study of the minds and sub-conscious operations of the various patients who are studied, and in the abolishment of those hidden "complexes" which are the chief cause of the trouble, in so many cases. (See ABNORMAL PSYCHOLOGY). The opening of such an institution will at all events stimulate investigation and inquiry along these lines.

Nevada. A State of the Mountain Division of the United States, having according to the census of 1910 a population of 81,875, which is a gain of 93.4 per cent over 1900. The population per square mile is 0.7. The area is 110,590 square miles, 960 of which is water. Carson City is the capital.

Agriculture.—There are 160,000 acres within the State subject to the Federal Irrigation project. The farm area consists of nearly 3,000,000 of which about 1-3 is improved land. The acreage, production and value of the important farm crops in 1910 were as follows: Spring wheat, production, 1,160,000 bushels, acreage, 40,000, value, \$1,264,000; oats, production, 313,000 bushels, acreage, 7,000 and value, \$197,000; barley, production, 360,000 bushels, acreage, 9,000 and value, \$252,000; potatoes, production, 600,000 bushels, acreage, 4,000 and value \$480,000; hay, production, 785,000 tons, acreage 231,000, value, \$8,478,000; the farm animals 1 Jan 1910, were: horses, 98,000, value, \$7,644,000; mules, 4,000, value, \$316,000; milch cows, 19,000, value, \$836,000; other cattle, 404,000, value, \$8,363,000; sheep, 1,585,000, value, \$5,864,000; number of sheep of shearing age, 875,000, average weight of fleece, 7.5 pounds; per cent of shrinkage, 69; wool, washed and unwashed, 6,562,500 pounds, and wool scoured, 2,034,375; swine, 15,000, value, \$135,000.

Mining and Manufactures.—The production of copper in 1910 was about 64,000,000 pounds. This is a gain in excess of 10,000,000 over the previous year. The Ely district furnished the main output. The ores there came entirely from Copper Flat pit. The Liberty area was being stripped during the latter part of the year preparatory to mining. The Giroux Consolidated Mining Company continued to develop its ores and prepare for their extraction, but made no production during 1910. Gold and silver are the chief mineral resources, the last figures available show the gold production to be 721,195 fine ounces, value, \$14,908,400 and silver, 8,953,000 fine ounces and value \$4,657,000. The decline in the gold production in Goldfield and Tonopah in Esmeralda and Nye counties was noteworthy during the year. Another important product is lead, the production for the last year in which figures are available being in value \$318,864. Other mineral resources are pyrites, iron, quicksilver, tungsten, sulphur, graphite, borax, gypsum and building stone. There were 177 manufacturing establishments in the State in 1909. Car making and repairing, flour and grist, butter, brewing and printing are among the important ones. The capital employed is \$9,807,000, the value of the product, \$11,887,000, the wage earners 2,257 and the salaries and wages paid \$2,360,000. The horse power statistics show 39 wheels of 20,577 horse power.

Government.—The Governor is Tasker L. Oddie, Republican, salary, \$4,000, and his term four years. Some other State officers are Lieutenant-Governor, G. C. Ross; Secretary of

State, George Brodigan; Treasurer, William McMillan; Comptroller, Jacob Eggers; Attorney-General, C. H. Baker, all Democrats except Oddie, Eggers, and McMillan, who are Republicans. The composition of the Legislature is Senate—Democrats, 11, Republicans, 9; House—Democrats, 22; Republicans, 27. The United States Senators are Francis G. Newlands, Democrat, and George S. Dixon, Republican. The Representative in Congress is Edward E. Roberts.

Finance.—The bonded debt is \$550,000. For 1910, the receipts were \$1,103,575.47 and the disbursements, \$1,008,829.94. The valuation of real property for the last year in which figures are available was \$50,482,256 and personal, \$23,373,885. There are 13 National banks with 2,395 depositors and \$1,165,114.68 deposits; 14 State banks with 2,262 depositors and \$1,234,813.27 deposits. The State has three private banks, and 1,074 depositors in the savings banks with deposits of \$745,441.54.

Religion and Education.—The denominations are as follows: Roman Catholic, 4,954 male and 4,166 female; Protestant Episcopal, 510 male and 565 female; Methodists, 171 male and 389 female. There was spent for the support of the common schools, the sum of \$199,900.18. The receipts of the school fund were \$137,514.61 and the disbursements, \$84,413.35. The receipts of the general school fund were \$191,269.10 and the disbursements, \$201,935.63. For the last year figures are available, the enrolled pupils amounted to 9,761, the average daily attendance 6,910 and the teachers numbered 414.

Charities and Corrections.—There is an orphan's home for the support of which was spent \$17,327.08. The poor are under the jurisdiction of a board of county commissioners who may either contract for their support or appoint agents to do so. A pauper must reside six months within a county to be entitled to any relief. Children of that class may be apprenticed to a householder. The last figures showed 166 inmates of the almshouse. Parents, grandparents, children, grandchildren, brothers and sisters are liable for the support of paupers. There were 217 prisoners in the State prison according to the last biennial report. A fire drill has been established which enables each man to be in his position three minutes after the alarm is sounded. The Bertillon system is also a feature.

Legislation.—There are biennial sessions. The last was in 1909 in which acts were passed regulating the business of the embalmer, fixing eight hours as a day's work in mines, and plaster and cement works, making it unlawful for employers to receive or demand any consideration for hiring or retaining employees, creating a parole system, providing for dependent, neglected or delinquent children, suppressing wild cat mining promotions, enacting an elaborate banking law, direct primaries and prohibiting faro and other gambling after 1st Oct. 1910.

History, 1910.—Pursuant to a State law already referred to, the gambling houses of Nevada were closed on 30 Sept. 1910 after doing business for 50 years. According to an opinion of the Attorney-General, whist, bridge whist, five hundred, solo, and all card games played for money are also under the ban. Slot machines have been banished.

Newark, N. J. According to the 1910 census Newark has a population of 347,469 and is the 14th city in point of size. The area is 2325 square miles and there are 286 1-3 miles of streets of which 201 are paved. The annual death rate is 17.77 and the birth rate 29.20. The net public debt is \$18,482,411. The average cost of the city government is \$7,500,000, of which \$2,018,170 is for schools having 57,742 pupils and 1,327 principals and teachers, \$609,280 for the fire department which has a membership of 390; and \$800,000 for the 581 members of the police department whose average annual arrests are 8,750. The assessed value of the real estate was \$274,326,398 and the personal property \$73,778,818. The average annual tax rate is 19.30. Newark spent \$11,000,000 for its water works. There is an average daily consumption of 36,000,000. The city has 371 miles of mains and 268½ miles of sewers. The annual cost of street lighting is \$44,000 for gas and \$193,000 for electricity. Newark is one of the great manufacturing cities of the United States. It is but nine miles from New York and this is a factor in its industrial development. Some leading manufacturers are foundry and machine shop products, caps, clothing, chemicals, hardware, saddlery and trunks, valises, iron and steel.

New Brunswick. A province in the eastern extremity of the Dominion of Canada. The area is about 27,985 square miles, of which about 75 square miles are water. The population was about 331,100 in 1901. The capital is Fredericton; inhabitants about 7,500. St. John is the chief town, with 40,000 inhabitants. Moncton, on the Intercolonial Railway, has a population of about 9,000.

Government.—The Provincial Government consists of a Lieutenant-Governor, and Executive and Legislative Councils. There are 46 members in the Legislative Assembly, elected by popular vote. The revenue in 1908 amounted to \$1,086,300, and the expenditure to \$1,041,550. The debt in that year amounted to \$3,997,250. Canadian banking institutions carry on general business throughout the Province.

Education, Justice, and Religion.—In the middle of 1908 there were 1,768 schools in New Brunswick, with 1,880 teachers and about 66,700 pupils; the Government expenditure on education being about \$185,000. In this, as in other provinces of the Dominion, the local Government has the appointment of magistrates and justices of the peace. There is a supreme court, and there are county courts. In 1901 there were 125,700 Roman Catholics in the population; 41,750 of the Church of England; 39,500 Presbyterians; 36,000 Methodists; and 80,900 Baptists.

Institutes, Trade, and Communications.—The agricultural products consist chiefly of grain. The wheat crop in 1908, was grown on 20,200 acres and yielded 349,000 bushels; oat crop, 203,900 acres, 5,057,000 bushels; barley crop, 3,500 acres, 79,000 bushels. There were in 1905 about 630 manufacturing establishments in New Brunswick, employing 6,581,400 persons, and producing goods to the value of \$22,134,000. The great industries of the Province, however, are fishing, lumbering, and mining. The fish-catch in 1905 was valued at \$22,271,500. The forest area is about 7,500,000 acres in extent. The British Empire provides a market for the

greater part of the provincial exports, and is the source of most of the imports. Considerable trade is carried on with the United States, however, and with other parts of Canada. There are in New Brunswick the most up-to-date facilities for the development of a country; in the shape of railway, telegraphic and telephonic conveniences.

New Caledonia. A French island colony in the Southern Pacific. Originally a convict settlement. Exclusive of its dependencies, viz Isle of Pines, Loyalty Islands, Huon Islands, Chesterfield Islands, the Wallis Archipelago, and the Society Islands (combined area more than 900 square miles, population about 6,600). New Caledonia has an area of about 7,200 square miles, and a population of 53,000. Of this number, 29,000 are black, 13,000 free, and 11,000 of convict origin. Since 1896 no criminals have been sent to the colony. The capital is Noumea, with 6,950 inhabitants, more than half being free.

Newfoundland. The oldest English Colony; an island in the extreme east of Canada; includes the habitable portion of Labrador in its territory.

Area and Population.—The area is about 42,730 square miles. The population in 1909 was estimated at 234,600. The Labrador dependency included, the total area is 162,730 square miles, approximately, and the population is increased 4,000. Immigrants numbered 10,000 in 1908, and emigrants about 10,250. The birthrate was almost three per cent and the death rate about 1.7 per cent of the population in 1907. Fishermen in 1901 composed about 30 per cent of the population; farmers 11 per cent; miners about 7 per cent; and mechanics, 14 per cent. The principal town, and the capital, is St. John's, 31,500 inhabitants. Other towns are Harbor Grace, 5,200; Carbonear, 3,700; Twillingate, 3,550; and Bonavista, 3,700.

Government and History.—The administration is effected through an Executive Council, of not more than nine members; a Legislative Council, 18 members appointed for life; and an Assembly, with 36 representatives popularly elected for four-year terms. There are ministers for all departments. The Governor receives an annual allowance of \$10,000. The colony is administratively divided into 18 districts. Since 1890 all men over 21 years of age have enjoyed the right to vote. The receipts of the Government in 1908-09 amounted to about \$2,947,850, and the expenditure to the same. The customs provided more than 82 per cent of the revenue. The public debt in 1908-09 amounted to \$23,056,600. Three banks do business in St. John's. The Newfoundland Savings Banks had deposits aggregating \$2,631,450 at the close of 1908, to the credit of 7,381 accounts.

Education and Religion.—The schools of the country are principally denominational. There were in 1907 about 275 Roman Catholic schools with 14,700 pupils; 325 English Church schools with 15,000 pupils; and 285 Methodist schools, with about 13,100 pupils; besides 30 sectarian schools with 1,000 total enrollment. There are colleges of the above-named denominations in Newfoundland, which have a total enrollment of about 1,000. The Roman Catholic population in the country is about 76,000; Episcopalian, 73,000; Methodist, 61,400; Presbyterian, 1,500; other religionists numbering 9,100.

Industry and Commerce.—About one-third of the colony's surface is estimated to be covered with water. The cultivated land is about 85,500 acres in extent. The most important products of the soil are potatoes, turnips, other roots, hay, barley, and oats. The mineral resources comprise valuable deposits of iron ore, copper ore, and pyrites, all of which are worked. Quartz, bearing considerable gold, silver, and lead are also found, as well as coal near St. George's Bay. There are splendid pine forests northward, and large lumber-mills have been turning out some timber. Pulp mills are about to be built. The live stock industry is prosperous. The great industry, however, is fishing, which provides the chief employment. The main imports into Newfoundland were about as follows in 1907-08: flour, to the value of \$1,750,650; textiles, \$1,428,750; coal, \$648,400; salt pork, \$627,450; molasses, \$268,400; hardware, \$367,800; machinery, \$356,850; and tea, \$187,900. The exports were chiefly as follows: dried cod and cod-oil, \$8,174,000; iron ore, etc., \$1,173,000; herring and lobsters, \$822,250; copper and ore, \$275,950; seal skins and oil, \$449,150. The total imports amounted to \$11,402,300, and the exports to approximately \$10,848,900. The United States contributed the value of \$3,859,900 in Newfoundland imports for 1907-08; Canada, \$4,257,650; and Great Britain, \$2,668,800. The exports from the colony were distributed chiefly as follows: to the United States, \$1,177,700; Great Britain, \$1,209,400; Canada, \$1,863,800; Portugal, \$1,733,350; and Brazil, \$2,017,800.

Shipping and Communications.—The registered shipping of Newfoundland in 1908 consisted of 3,290 sailing vessels, and 66 steam; total tonnage, 147,185 tons. Vessels entered and cleared at the ports in the same year represented a tonnage of 1,935,085 tons, more than half of which was British.

New Guinea. An island in the Pacific. About 90,540 square miles of the territory is occupied and governed by Great Britain; 70,000 square miles by Germany; and about 151,800 square miles by the Dutch. The population of the three divisions is approximately 870,000. The capital of the British colony is Port Moresby, with 1,500 inhabitants. The German and Dutch government towns are Herbertshöhe (in the Bismarck Archipelago), and Batava (in the Island of Java); population, 138,550. There are some Europeans in the Island. Provisions are made for education; justice is properly administered; and the Christian religion is preached. The soil is fertile in many localities, and the products include coconuts, gums, ebony, sandalwood, etc. Minerals in considerable quantities exist and are exported. There are some good ports; water communication and postal communications are good.

Australia was given charge of the British portion of New Guinea in 1906 and in the succeeding years the island has advanced more rapidly towards civilization than in the whole of its previous history.

A large part of the island which had not previously been visited was explored during 1910. There communities were discovered living in single buildings 600 feet long and 70 feet high, sheltering as many as 1,500 people. Cannibalism is practiced among these tribes under a carefully maintained ritual.

NEW HAMPSHIRE—NEW JERSEY

New Hampshire. A State belonging to the New England division of the United States, with an area of 8,315 square miles, of which 275 square miles are water. The capital is Concord. The population of the State in 1910 was 430,572, being an increase of 18,984 or 4.6 per cent since 1900. The population per square mile is 47.7. New Hampshire ranks 39th in population.

Agriculture.—The total land area of the State is 5,763,000 acres, of which 1,441,000 are cultivated, 720,000 acres uncultivated, and 3,602,000 acres under forest. The number of farms reported in 1910 was 26,913, as compared with 29,324 in 1900. Some statistics of the chief crops in 1910 were. Corn acreage, 31,000; production, 1,426,000 bushels, value, \$98,400. Oats, acreage, 14,000; production, 599,000 bushels; value, \$305,000. Barley: acreage, 2,000; production, 52,000 bushels; value, \$40,000. Buckwheat: acreage, 2,000; production, 62,000 bushels; value, \$38,000. Potatoes: acreage, 21,000, production, 3,150,000 bushels; value, \$1,638,000. Hay acreage, 640,000, production, 768,000 tons; value, \$12,134,000.

Mining and Manufactures.—Metals are little worked but granite and mica are quarried. The value of the granite output in 1908 was \$857,028. In 1908 the clay products were valued at \$371,640. The manufacturing interests, aside from forest products, are largely confined to the Southern part of the State.

Government.—The Governor of the State is Robert P. Bass (elected 1911), with a salary of \$3,000. The Secretary of State is Edward N. Pearson, Treasurer, Solon A. Carter; Auditor, William B. Fellows; Adjutant-General, Harry B. Cilley; Attorney-General, Edwin G. Eastman. All Republicans.

Finance.—The financial statement for the year ending 1 Sept 1910, was as follows: Total annual receipts, \$3,046,215; total disbursements, \$2,666,771, cash on hand, 1 Sept. 1910, \$379,444.

Education.—At the last school census (1908) there were 2,127 schools; 1,234 graded schools and 54 high schools. The public schools of the State had 2,655 teachers, and 74,065 enrolled pupils. The normal school had 14 teachers and 180 students. The principal colleges within the State are Dartmouth at Hanover, and the New Hampshire College of Agriculture and the Mechanic Arts at Durham.

Charities and Corrections.—Within the State there are 50 benevolent institutions. On 1 Jan. 1910, the almshouses had 1,410 pauper inmates. There were 168 inmates admitted in the New Hampshire State Prison during 1910, of whom 136 remained at the end of the year.

Legislation.—There was no regular legislative session in New Hampshire in 1910. In 1909 the Legislature enacted a direct primary nomination law; established a forest commission; appropriated \$1,000,000 for the improvement of three main highways; required the registration of legislative counsel; adopted a State flag, enacted the negotiable instrument law of the American Bar Association; established dispensaries for the detection and treatment of tuberculosis, and provided for the intermediate sentence and parole of prisoners.

History.—Robert Perkins Bass, Republican, was elected governor of the State over the Democratic candidate, L. E. Carr, by a plurality

of 7,171. The new governor polled 44,908 votes in the entire State. The nomination of R. P. Bass for governor over Bertram Ellis, of Keene, was represented as 'the first important victory of the progressive republicans of New Hampshire. It was the first nomination of a gubernatorial candidate by direct primary in the State. During October, Wolfboro was the centre of a cyclonic wind such as never visited New Hampshire and it left in its wake unroofed houses, barns and outbuildings blown from their foundations. In some instances, it demolished whole groves of trees and it uprooted gravestones and monuments in Lakeview Cemetery.

New Jersey. A State of the Middle Atlantic Division of the United States having a population, according to the 1910 census of 2,537,167, a gain of 34.7 per cent in the last 10 years. The population per square miles is 337.7. New Jersey has a land acreage of 7,525 square miles. Its capital is Trenton, with a population of 97,000.

Agriculture.—The farms for 1910 numbered 33,161 which is a decrease of 4 per cent over 1900. The total acreage was 2,562,000, which is a decrease of 10 per cent for the same period. The value of the land and buildings on the other hand was \$213,141,000, which is an increase of 31 per cent over 1900. The value of the implements and machinery was \$12,955,000, an increase of 39 per cent. There were expenditures for labor amounting to \$10,530,000, a increase of 57 per cent and for fertilizers of \$4,206,000, a gain of 94 per cent over 1900. According to the figures of Secretary of Agriculture, the acreage, production and value of the important New Jersey Farm Crops for 1910 were as follows: Corn, 10,440,000 bushels, acreage, 290,000, value, \$10,440,000. Winter wheat, 2,053,000 bushels, acreage, 111,000, value, \$2,012,000; oats, 2,226,000 bushels, acreage, 60,000, value, \$979,000; rye, 1,530,000 bushels, acreage, 85,000, value, \$1,178,000; buckwheat, 280,000 bushels, acreage, 12,000, value, \$193,000; potatoes, 9,975,000 bushels, acreage, 95,000, value, \$6,484,000; hay, 656,000 tons, acreage, 437,000, value, \$11,939,000.

Mining and Manufactures.—The last available figures on the subject give the mineral output of the State at \$21,315,631. The clay products are the most important. They comprise brick and tile, the output of which was \$6,363,705 and pottery \$1,000,000. There has been a steady decrease in these industries, it amounting to as high as \$3,000,000 in brick and tile and \$1,000,000 in pottery. Portland cement is another important product. It is produced at 3 plants in the State. The value of the product for the last year in which figures are given was \$2,416,009, which was from 3,208,446 barrels. These figures also show a decrease over previous years. The same may be said with reference to pig iron. The production for the last year in which figures are given was 225,372 long tons, value, \$3,370,000. There were 11 blast furnaces, but only three were in blast at the time of writing. There are beds of magnetite iron ore. They had an output of 394,767 tons of the value of \$1,162,474. The sandstone, sand and gravel, lime and glass sand are other mineral products. The capital employed in manufactures amounts to \$715,060,174; the value of the product, \$774,366,025, the number of persons employed, as wage earners, 266,336 and the wages paid, \$128,168,801. The textile is the



WOODROW WILSON,
GOVERNOR OF NEW JERSEY

NEW JERSEY

leading industry. It gives employment to 57,790 wage earners. The capital invested is over \$90,000,000, the output is close to \$100,000,000, and more than \$50,000,000 is spent for raw material. Foundry and machine work comes next. Its capital is over \$60,000,000, the raw material in excess of \$20,000,000 and the industry gives employment to 25,000 wage earners. The output of the copper smelting industry is next to the textile. It is in excess of \$62,000,000. Despite this, there are not over 1,500 wage earners engaged in it. The value of the raw material is nearly \$60,000,000. Silk manufactures have an annual output of over \$40,000,000. There are 44 establishments for canning fruit and vegetables. They employ 4,865 persons and their output is 40,000,000 pounds of vegetables, including tomatoes, peas and pears.

Fisheries—Trout, perch, and black bass are to be found in the lakes, while shad, menhaden, and sturgeon abound in the Delaware River and round the coast. Shell fish is also very numerous. The oysters for a single year amounted to 919,500 bushels valued at \$883,880 and those for seeding purposes numbered 1,666,900, value \$484,620. The bushels of clams taken numbered 305,800 of the value of \$336,500. Other fish statistics are shad, 3,004,200 pounds, value, \$229,490; squeteague or trout, 11,814,000 pounds, value, \$341,600; sea bass, 3,160,600 pounds, value, \$123,350; cod, 3,766,700 pounds, value, \$129,930; blue fish, 1,802,500 pounds, value, \$96,850. There were over 4,000 independent and 3,190 wage-earning fishermen.

Government—The Governor is Woodrow Wilson, Democrat, salary, \$10,000, whose tenure is three years and term expires 1 Jan 1914. The Secretary of State is S. D. Dickinson; Treasurer, Daniel S. Voorhees; Attorney-General, Edmund Wilson; all Republicans. The Legislature stands as follows: Assembly—Democrats, 42; Republicans, 18; Senate—Democrats, 9; Republicans, 12. New Jersey is represented in the United States Senate by Frank O. Briggs, Republican, and James Martine, Democrat. Its Congressmen are: H. C. Loudenslager, Republican; John J. Gardner, Republican; Thomas J. Scully, Democrat; Ira W. Wood, Republican; William E. Tuttle, Jr., Democrat; William Hughes, Democrat; E. W. Townsend, Democrat; Walter I. McCoy, Democrat; Eugene F. Kinkead, Democrat; James A. Hammill, Democrat.

Finance—The report of the State Treasurer shows receipts of \$20,919,981.61, and disbursements of \$14,206,429.80. The receipts of the State fund were \$8,534,969.96, and the disbursements, \$7,670,663.69. The local tax on railroad corporations yielded \$1,119,382.10, and on motor vehicles, \$323,880.35. The balance in the bank to the credit of the State Fund, on 31 Oct. 1910, was \$4,545,188.68. There is no bonded debt. The last available figures gives the assessed value of taxable, real, and personal property at \$1,841,527,418, of which 85 per cent is real. According to the figures of the Comptroller of the Currency furnished for the National Monetary Commission, there were 178 National banks, having 94,280 depositors and \$34,202,470.27 deposits; 18 State banks, with 9,844 depositors, and \$2,899,285.32 deposits, and 309,338 depositors in the savings banks having \$106,762,662.84 deposits. The private banks numbered seven with 2,147 depositors, and \$398-

213 34 deposits. There were 70 loan and trust companies with deposits of \$72,917,470.11 and 238,397 depositors.

Religion and Education—The religious denominations of a leading character are as follows: Roman Catholics, 441,432; Baptists, 64,238; Presbyterians, 78,490; Protestant Episcopal, 53,921; Reformed Church, 32,290; other Protestant bodies, 48,203, and Lutherans 15,323. There are 561,958 children of school age, of which 394,060 are enrolled in the schools. The cost of maintaining them are \$12,190,962. There was expended for teachers' salaries, the sum of \$8,071,177.45. The average salary was \$718.40. The school buildings numbered 1,978, and in addition there were 74 rented. The number of teachers employed were 11,235. New Jersey has a Public School Teachers' Retirement Fund. The first annuity under it was granted on 3d Dec 1897. According to the last available figures, there were granted 236 annuities amounting to \$88,347 per annum.

Charities and Corrections—The last appropriation for charities made by the Legislature was \$1,282,525. There are two insane hospitals, two institutions for the feeble minded, an epileptic village, an institution for tuberculosis patients, and two Soldiers' homes. There are overseers in the cities, towns, and corporate townships who have jurisdiction over the administering of relief to paupers. Pauper children are boarded out. It is illegal to introduce alien paupers into the State. The last available figures show that the total expenditure during the fiscal year of the New Jersey State Prison amounted to \$268,958.66, of which \$125,717.37 was for maintenance. The cash receipts amounted to \$105,469.20. The cost of food per diem for each prisoner amounted to \$0.1232. There is a prison library of 3,000 volumes. The prisoners numbered 1,987. The ages of the majority were from 30 to 40 years. The Woman's Wing has 29 cells, but an agitation for its enlargement is at present going on.

Legislation—The Legislature meets annually. The 1910 session passed a law licensing motor boats; permitting minors to become depositors in banks, and clothing them with the rights of adults and the same liabilities; creating a Board of Examiners for midwives; prohibiting minors under 16 from being employed more than 55 hours a week, and those under 15 from working between 6 at night and 6 in the morning, and raising the age to 16 after 4 July 1911, authorizing sheriffs to appoint jail matrons and establishing a State reformatory for female prisoners under 17, creating a commission to investigate employer's liability, and a second to consider old age pensions; defining the adulteration of spirits of turpentine; declaring tuberculosis an infectious disease and requiring doctor's reports, examination of sputum, disinfection of premises, care of the diseased, and distribution of circulars of information; authorizing tuberculosis hospitals; appointing Public Utility Commissioners with jurisdiction over railroads, street railroads, canals, subways, pipe lines, traction, gas, electric, water, express, sewers, telephone, and telegraph companies; a law for the physical valuation of the railways and a separate one for the franchises; authorizing local authorities to regulate the sale of fireworks and other explosives; various acts dealing with the water-

NEW JERUSALEM—NEW MEXICO

ways, wharves, docks, and ferries; authorizing the creation of town planning and art commissions for the consideration of public improvements, legislation having to do with the subject of prostitution and making it a misdemeanor to negotiate warehouse receipts for goods not actually deposited.

History—The beginning of 1911 witnessed the climax of the contest over the United States senatorship. This occurred inside of the Democratic party. Primaries had been held on the subject at which John Martine received the majority of votes. The total vote compared to the normal Democratic was small. The adherents of James Smith, Jr., of Newark, a former United States Senator and party leader, declared that the primary result did not bind the Democratic members of the Legislature, so he entered the race himself. Governor Wilson, however, took the ground that as Martine had received a majority vote in the primaries, the party was in honor bound to elect him. There was a spirited contest before the Legislature met, but after a few ballots, Smith withdrew and Martine was chosen. Paterson celebrated the 100th anniversary of the manufacture by power machinery in the United States of silk fabrics on 9 Nov. 1910. The celebration lasted nine days. There are 292 silk firms there at present who give employment to 40,000 men and women.

New Jerusalem, Church of the. See CHURCH OF THE NEW JERUSALEM

New Mexico. A southwestern division of United States.

Area and Population.—The area of New Mexico is 122,460 square miles. The population, according to the census of 1910, is 327,396, showing a gain of 67 per cent during the last decade. Land office statistics show that 520,145 acres have been proved up and 1,800,686 entered from 30 June 1909 to 30 June 1910. A new land office, authorized at the last session of congress, was opened at Fort Sumter on 1 Oct. 1910. The State Capital is Santa Fe, with more than 8,000 inhabitants.

Constitution and Government.—The constitution of New Mexico was completed on 21 Nov. 1910, and the vote for its ratification fixed for 21 Jan. 1911. The document contains 20,000 words. There is provision for an elective corporation commission, having authority to regulate railroads, issue charters and supervise corporations. Its rulings, however, are subject to review by the State Supreme Court. There is a referendum clause under which a petition of 25 per cent of the voters may suspend any law within 90 days of a legislative session, and 10 per cent of the voters may submit a law passed by the last Legislature to a vote at the next election, while a majority of the Legislature may submit constitutional amendments to the people. Prohibition and local option are left to the next Legislature to deal with. A drastic anti-pass section has been incorporated. The tax rate is limited to 12 mills for 2 years and 10 mills thereafter. A clause raises a boundary dispute with Colorado, another provides for an elective judiciary, and State officers and women are given the right to vote in school elections and to be directors and superintendents. The fee system in county offices is abolished. Separate schools for Anglo-

Saxons and Spanish-Americans are prohibited. There is proviso for the payment of \$1,000,000 of railroad bond indebtedness by the sale of land grants. No distinction is to be made against non-English speaking persons on juries or in the county offices.

The officials of the government are as follows: Governor, William J. Mills, Secretary, Nathan Jaffa, Treasurer, Miguel A. Otero; Auditor, W. G. Sargent, Adjutant-General, A. S. Brooks, Attorney-General, Frank W. Clancy; and Superintendent of Education, J. E. Clark. Chief Justice of the Supreme Court is W. H. Pope. The Congressional vote in 1910 showed a Republican plurality of 388, Republican votes, 27,605; Democratic, 27,217, Socialist, 1,056. At the Delegates Constitutional Convention of Sept. 1910, there was a Republican plurality of 4,049 votes. Under the Enabling Act, the delegates to congress and all other officers elected in Nov. 1908, hold over until New Mexico is admitted as a State.

Boundaries.—There is a dispute between New Mexico and Texas over the claim by the former of territory west of the 103d parallel, which Texas has assumed ownership of. New Mexico is on the point of demanding \$10,000,000 from Texas, which the latter State has received for taxes and licenses in the disputed territory. The New Mexican contention sets forth that congress fixed the boundary between the western line of the Texas Panhandle and the eastern line of New Mexico at the 103 parallel and that the Texas Legislature confirmed this. The Clark survey for this meridian was wrong. He took the Washington time instead of the Greenwich when surveying. The result is that Texas controls about 600,000 acres of land, which, according to New Mexico, she once admitted belonged to her.

Finance and Banks.—Balance in the treasury, 1 June 1909, was \$527,198.16; receipts for the year were \$1,032,914.63. The disbursements for the year were \$1,074,963.65, leaving balance on hand, 1 June 1910, of \$485,149.14. During 1910 the territorial rate of taxation was lowered from 14.45 mills to 11, a decrease of 24 per cent. The property returns for taxation are made on a basis not exceeding 20 per cent of the actual value. The outstanding bonds of the territory amounted to \$1,104,500 on 1 June 1909. During the year ending 1 June 1910, \$88,000 provisional indebtedness bond, \$10,000 current expenses, and \$5,000 certificates of indebtedness have been paid and retired, leaving a total bonded indebtedness, 1 June 1910, of \$1,001,500. The banking interests of New Mexico, on 30 June 1910, were represented by 81 institutions, of which 41 were national and 40 territorial banks. Their total capitalization was \$3,302,650, and the total resources and liabilities, \$25,329,893. During the year, 6 new banking institutions were established and are operating under the territorial banking act. There were no failures.

Education.—According to the census of Aug. 1909, there were 95,101 persons of school age, 5 to 21 years. The public schools enrollment for June 1910 was 56,162. Fully 5,000 persons listed in the school census were enrolled in private and sectarian schools. The compulsory school law has been successfully enforced. The average attendance during the past year was 37,056, as against 29,547 for the previous year.

NEW MEXICO — NEW NATIONALISM

The public school property is valued at \$1,000,000, and the bonded indebtedness \$600,000. The University of New Mexico has an alumni list of 112, and 17 professors and teachers. There is a normal school at Silver City, a school of Mines at Socorro, a military institute at Roswell, a college of agriculture and mechanic arts at Mesilla Park, and a Spanish-American normal school at El Rito.

Agriculture and Irrigation—From less than 400,000 acres in 1900, agriculture has extended to 1,000,000 acres, actually producing, and irrigation and dry farming will serve to double these figures. It is claimed that there are 3,000,000 acres which may be reclaimed by practicable diversion, storage, and pumping projects. An irrigation project that will deliver water to 18,000 acres is to be completed at Las Vegas in 1912. An important central pumping plant in Portales, Roosevelt county, will furnish power to pump water for 10,000 acres. By direct diversion from the Pecos River, Guadalupe county, 16,000 acres have already been reclaimed.

During the fiscal year ending 30 June 1910, the irrigation department received 158 applications to appropriate water, covering 617,816 acres of land. Construction has begun under 20 of these applications, work under 6 more has been 1-5 completed and 9 of the projects have been completed. Two irrigation districts have been organized and the construction work now under way will be completed during 1911. These projects are the Orchard Irrigation district at Aztec San Juan county, 12,000 acres, and the Las Vegas project. Dry farming in the State is still considered in its experimental stage. The railroads entering New Mexico are about to undertake an educational campaign for dry farming.

The Live-Stock Industry.—During the year ending 30 June 1910, the shipment of cattle has been heavy, 299,255 cattle and 10,988 horses having been inspected. Also 56,775 hides are reported for that period. The prices were good and showed an advance over the previous year. Yearlings brought \$18 to \$21 as against \$12 to \$17 in 1909. Two-year-olds sold at \$25 to \$28 as against \$20 to \$26 in 1909. Cows brought \$19 in the southern and \$25 in the northern portion of the territory. Sheep, to the number of 719,444, were shipped; in the spring of 1910 there were about 3,500,000 sheep in pasture.

Fisheries and Game, Mining, and Public Institutions—The trout, streams of Arizona are ardently sought. A hatchery should be installed. There are various kinds of splendid game: deer, grouse, wild turkeys, and wild pigeons. The minerals of the State include vast deposits of copper, besides lead, zinc, and coal. The gross production of coal in 1900 aggregated 3,293,486 tons, and the net production was worth \$3,503,904. The year's showing of coal-mine products was 1979 per cent, above that of 1909. Total number of men and boys employed, 2,861. Among the public institutions there is the New Mexico Penitentiary, at the capital. Receipts fiscal for the year, \$105,979.76; expenditures, \$99,798.04; profit for the year (to June 1910), \$6,181.72. There is an asylum at Las Vegas; a reform school at Springer; a deaf and dumb institute at Santa Fe; a blind institute at Alamogordo; and a miners' hospital at Raton. There is, also, the Museum of

New Mexico and School of American Archaeology.

New Nationalism. A phrase used by Theodore Roosevelt in speeches delivered during his tour through the West, from 23 Aug. to 11 Sept 1910. He defined it thus: "The New Nationalism puts the national need before sectional or personal advantage. It is impatient of the utter confusion that results from local legislatures attempting to treat national issues as local issues. It is still more impatient of the impotence which springs from the over-division of governmental powers, the impotence which make it possible for local selfishness or for legal cunning, lured by wealthy special interests, to bring national activities to a deadlock. . . . "This New Nationalism regards the executive power as the steward of the public welfare. It demands of the judiciary that it shall be interested primarily in human welfare rather than in property, just as it demands that the representative body shall represent all the people, rather than any one class or section of the people."

It recalls the old issue of States Rights. It is a fight for progressive popular government. The speech he delivered at Oswatome, Kansas, sets forth the new political creed, which, Mr Roosevelt declared, "will certainly go on to a triumphant conclusion in spite of initial checks and irrespective of the personal success or failure of individual leaders." He declared in that speech for: (1) Elimination of special interests from politics; (2) complete and effective publicity of corporate affairs; (3) prohibition of the use of the corporate funds directly or indirectly for political purposes; (4) government supervision of the capitalization not only of public service corporations, but of all corporations doing an interstate business; (5) personal responsibility of officers and directors of corporations that break the law; (6) increased power of the Federal Bureau of Corporations and the Interstate Commerce Commission to control industry more effectively; (7) revision of the tariff, schedule by schedule, on the basis of information furnished by an expert tariff commission; (8) graduated income and inheritance taxes; (9) reformation of the country's financial system to prevent periodical financial panics; (10) an efficient army and navy, to insure the respect of other nations as a guarantee of peace; (11) conservation and use of national resources for the benefit of all the people; (12) extension of the work of the Department of Agriculture, of the National and State governments, and of agricultural colleges and experiment stations, to improve all phases of life on the farm; (13) comprehensive workmen's compensation acts; State and National laws to regulate child labor and the work of women; enforcement of better sanitation conditions for workers, and extension of the use of safety appliances in industry and commerce, both in and between the States; (14) clear division of authority between the National and the various State governments; (15) direct primaries, associated with strong and efficient corrupt practices acts; (16) publicity of campaign contributions both before and after election; (17) prompt removal of unfaithful and incompetent public servants; (18) provisions against the performance of any service for interstate corporations or the reception of any

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compensation from such corporations by national officers.

Mr. Roosevelt said in part: "At many stages in the advance of humanity this conflict between the men who possess more than they have earned and the men who have earned more than they possess, is the central condition of progress. In our day it appears as the struggle of free men to gain and hold the right of self-government as against the special interests, who twist the methods of free government into machinery for defeating the popular will. . . .

"There can be no effective control of corporations while their political activity remains. To put an end to it will be neither a short nor an easy task, but it can be done.

"We must have complete and effective publicity of corporate affairs, so that the people may know beyond peradventure whether the corporations obey the law and whether their management entitled them to the confidence of the public. It is necessary that laws should be passed to prohibit the use of corporate funds directly or indirectly for political purposes; it is still more necessary that such laws should be thoroughly enforced. . . .

"It has become entirely clear that we must have government supervision of the capitalization not only of public service corporations, including particularly railways, but of all corporations doing an interstate business. . . .

"I believe that the officers, and especially the directors, of corporations should be held personally responsible when any corporation breaks the law."

He justifies a policy of government control of "swollen fortunes," thus:

"We grudge no man a fortune which represents his own power and sagacity, which is exercised with entire regard to the welfare of his fellows. But the fortune must be honorably obtained and well used. It is not even enough that it should have been gained without doing damage to the community. We should permit it to be gained only so long as the gaining represents benefit to the community. This, I know, implies a policy of a far more active governmental interference with social and economic conditions in this country than we have yet had, but I think we have got to face the fact that such an increase in governmental control is now necessary."

Lyman Abbot, commenting on New Nationalism in *The Outlook*, of which he is editor, and of which Theodore Roosevelt is contributing editor, referred to it as a continuation of an historical process involving a succession of extensions of national power. "Its latest development," he states, "is two-fold. The right of the people to exercise, through the proper officials, such a strict supervision as will make the highways of the nation open to the use of all the people on equal terms, and the right of the people to keep the ownership and the control of such mineral and forest lands and water power sites as now belong to them, that they may not fall under the control of private and unregulated monopoly. . . .

"Because I believe in the capacity of the people for self-government, I believe in a strong executive. The founders of the constitution were wise not to enumerate the powers of congress; they did wisely in conferring upon him in general terms all the executive powers

which belong in a constitutional government, to its executive head. There is no peril to the Republic in a strong executive; there would be much peril to it in a weak executive. . . . Fear of presidential usurpation springs from distrust of the popular judgment and the popular courage. I believe in the intelligence and the courage of the American people.

"The New Nationalism is a movement for individual liberty and for social coherence and cooperation. It is a world movement. It is seen in the establishment of the republic of a united France on an apparently firm foundation; in the unification of Germany and the growth of German democracy; in the liberation and unification of Italy; in the Democratic development of Great Britain, and the more intimate connection of the Mother Country with her colonies, foreshadowing a federation in the near future, in the contemporaneous development of democracy and nationalism in the United States; and in the simultaneous beginnings of representative government and of centralization in China."

New Orleans, La. According to the 1910 census New Orleans has a population of 339,075, a gain of 18.1 per cent over 1900. It is the 15th city in point of size, in the Union. The area is 196 square miles. New Orleans has 774 miles of streets, of which 274 are paved. The annual death rate is 18.5 per cent. Its net public debt is \$34,848,202. The annual cost of the city government is \$3,446,350, of which \$1,385,873 is for the maintenance of the public schools, whose pupils number 42,733 and teachers and principals, 1,122; \$389,832 for the fire department of 391 members; and \$408,641 for the 330 police whose annual arrests average 27,000. The assessed value of the real property is \$162,589,560, and the personal, \$68,265,877. The tax rate is \$23. The city owns its own water supply, which cost \$7,600,000. There are 505 miles of mains and the average daily consumption of water is 15,000,000 gallons. The annual cost of electric lighting from private corporations is \$244,503. There are 330 2-3 miles of sewers. In 1909, the net receipts of cotton (running bales) at the port of New Orleans was \$2,093,232. For the fiscal year ending 30 June 1910, there was an increase of merchandise commerce of 47.05 per cent. A large business was done with Cuba and Central and South America. There was also a big coastwise trade with New York, Philadelphia, the Florida ports, and Porto Rico.

New South Wales. An Australian State, situated in the southeast of the Commonwealth.

Area and Population.—The State of New South Wales is about 310,370 square miles in extent. In 1910 the population was approximately 1,664,650, the males exceeding in numbers the females by about 125,000. Births for 1909 averaged 26 per cent of the population; and deaths 95 per cent. Full-blooded natives numbered 4,300 in 1910. Sydney, the capital, has population, including the suburbs, of about 605,900. The town is said to have the best harbor in the world. Vast parks beautify the city. There are museums, libraries, cathedrals, and splendid educational institutions. Some of the other important towns of the country are Newcastle, 65,500; Broken Hill, 31,000; Bathurst, 9,750; Goulburn, 10,800; Granville, 8,000; and Parramatta, 13,600.

Government and Finance.—Virtually every citizen in the State 21 years of age is entitled to the franchise. There are votes for women, since 1902. There are 90 administrative districts, each of which sends a member to the Legislative Assembly. The Legislative Council of the Government usually consists of from 50 to 60 members; there must not be less than 21. The Assembly members receive a yearly allowance of \$1,500, but the members of the Council who are appointed for life by the Crown, receive free railway passes as a sole emolument. The Governor exercises the executive. The prime minister is the attorney-general as well and there are in the Government, the usual departmental ministers. The local administration is up-to-date. Receipts of the Government for 1909-10 aggregated \$70,882,850, and the expenditure \$63,561,000. The public debt in the middle of 1910 was about \$451,059,850. Public works, for the most part, have created this debt. The principal sources of revenue are taxes, land revenues, business undertakings, etc. The public wealth of New South Wales in 1901 amounted to about \$762,138,000 and the private wealth to about \$13,460,025,000.

Agriculture and Resources.—Some localities are arid, and their agricultural interests are being enhanced by extensive irrigation. About 3,174,700 acres of land were cultivated in 1909-10. Grains of various kinds are grown in large quantities. The wheat crop for 1909-10 amounted to 28,532,000 bushels; oats, 1,966,200 bushels; maize, 6,986,000 bushels; potatoes, 89,000 tons; tobacco, 6,495 cwt.; sugar-cane, 131,080 tons. In 1909 654,000 cases of oranges, lemons, etc., were packed, other fruit was produced in large quantities, and wine amounting to 736,260 gallons. Stock-raising is a great resource to the country. At the close of 1909 there were 604,775 horses; 2,223,150 cattle (not including 794,550 milch cows); 46,187,700 sheep; and 237,850 swine. The wool production weighed 370,808,000 pounds, and was valued at \$63,999,000. Tallow produced amounted to 638,400 cwt.; butter to 63,865,600 pounds; cheese to 4,775,275 pounds; and hams and bacon to 99,257 cwt. The mineral deposits of the State contain coal, coke, copper, silver, lead, zinc, bismuth, tin, iron, antimony, asbestos, platinum, alunite, wolfram, scheelite, cobalt, etc., and precious stones. Gold to the value of about \$4,239,000 was mined in 1909; silver and alloys worth \$8,061,400; and coal to the value of about \$12,765,650. The total mineral output was worth about \$36,090,650. The manufacturing industries comprise cloth manufactories, stationery establishments, furniture factories, machine shops, chemical-producing laboratories, dairies, etc. There are 4,453 "houses of industry" in the country, giving employment to 89,100 hands, and the financial investments represented aggregate about \$79,545,000. The imports into New South Wales in 1909-10 were valued at \$185,420,450, and the exports abroad at \$203,952,300. The leading articles of exports consist of gold, wool, coal, butter, meat (fresh and canned), and hides and skins.

Banks, Railways, Telegraphs, Posts, and Shipping.—Deposits in the savings banks of the country aggregated about \$98,234,000. There were 15 banks of issue in 1910. There is a total length of railway line of about 3,900 miles, 3,650 of which are government-owned. The revenue of the latter for 1909-10 amounted to \$19,770,350.

net. There are 170 miles of electric line in the country. Telegraph offices numbered 1,330 in 1910. Length of telegraph and telephone line, 17,090 miles; of wire, 97,600. Telegraphic messages received, dispatched, and transmitted, 4,286,000. There are about 2,400 postoffices. Postal communications handled in 1909-10, about 246,422,350, of which 151,570,250 were letters and postal cards. In 1909, 5,628 vessels entered at the ports; tonnage, 11,559,450.

Education, Religion, and Justice.—The government appropriation toward public instruction in 1909 was \$6,406,700. Education is free, and it is obligatory. In 3,215 State schools, the above year, there were 238,500 pupils. Private and denominational schools and colleges numbering about 800 have a total enrollment of over 60,000. Business colleges also exist. Roman Catholics in New South Wales number about 347,300, and Protestants comprise two-thirds of the population. Justice is administered in courts of magistrates, of quarter sessions, in the Supreme Court, and in a Children's Court. Convictions before magistrates in 1907, 58,100. About 1,400 prisoners were confined in 52 gaols in 1908; the following year showed a falling off. Old age pensions are granted. There are more than 25,000 pensioners in the country. Among the public institutions, there are hospitals numbering 137. There is a fine university at the capital, and there is the National Art Gallery. A branch of the Royal Mint exists at Sydney.

New Thought. During the past few years, a system of practical optimistic thought has grown up, in America particularly, which has as its object the bettering of human life, through self-control and self-mastery, and by means of a practical optimistic view of life. It might be said, in fact, that New Thought consists in a sort of practical optimism; to which are added a number of other attributes, so that the whole forms a loose system, if not of philosophy, at least of daily life. Its fundamental doctrine is its practical application to daily life and needs; hence it is, above all, pragmatic in its point of view. Most "New Thinkers" would probably have, each his own definition of the nature of the movement; some believing it represents one thing; some another. Mr. William Walter Atkinson, a pioneer in this field, and the last editor of *The New Thought Magazine*, writes as follows (September 1910) in answer to the question: What constitutes the fundamental principles of New Thought?

"In the first place, I would say that, to my mind, the idea of the Immanent Spirit is the leading and cardinal principle of the New Thought—many terms are used to indicate this principle, but the same idea underlies the various terms and teachings.

"In the second place, I would say that the correlated cardinal principles of the New Thought is that of the All-ness of Spirit. By this is meant not only that Spirit is *in* all, but that Spirit is actually all there is, and that therefore everything that exists in the manifested universe must, necessarily, be in and of Spirit. Not only is Spirit in all, but all are in Spirit—and, in the end, Spirit and all are identical.

"These two principles are opposed to the idea of an alien Deity of a Nature foreign to the manifested universe, who dwells apart; and who

made the world from nothing, set it going, and then stood aside and watched it run itself. The New Thought idea is that in this Universal Spirit 'we live and move and have our being'—that we are manifested expressions of, and in turn, Spirit—and that Spirit, therefore, must be *in us* as well

"Again, it may be said that the New Thought holds it to be self-evident that this Immanent and All-Spirit is, and must be, living acting principle. It cannot conceive of reality—call it by what name you choose, being inert and dead—it must be considered as living and acting . . .

"But, it may well be urged, this idea of Absolute idealism is not new to the world of thought—it is as old as philosophy, and is found in the ancient teachings of India, Greece, and other lands, and has been taught constantly for thousands of years. Wherein does the New Thought conception differ from others? The answer is easy! New Thought does not rest content with asserting that all is spirit, and spirit is in all manifestation—it does not content itself with urging the acceptance of the philosophical and metaphysical conception—it insists upon the pragmatic application of the principles. It attempts to teach how the principles may be used in the life of men. It teaches that the wonderful spiritual power in each and every person—the power dwelling within each mind—may be employed to the mental, spiritual, and physical welfare of each individual. It teaches that a man is largely what he thinks—and that he may change the current and nature of his thoughts, and, consequently, make of his body and his mind what he will. It holds that, all being mind at the last, then Mind Power must be, and is, the greatest force in Nature, capable of being employed in active, creating work."

New York. A State of the Middle Atlantic division of the United States with an area of 49,170 square miles, of which an area of 1,550 square miles is water. The population is 9,113,614, which is an increase of 1,844,720 or 25.4 per cent in the past 10 years. The population is 191.2 per square mile. New York ranks first of the States in population. The capital is Albany with a population of 100,253, but the largest city, not only of the State but of America, is New York, with 4,766,883 inhabitants

Agriculture.—New York has large agricultural interests. The acreage, production, and value of important farm crops in New York State in 1910 were as follows: Corn, acreage, 680,000 acres; yield per acre, 38.3 bushels; production, 26,044,000 bushels; total farm value, \$16,408,000. Winter wheat, acreage, 444,000 acres; yield per acre, 23.7 bushels; production, 10,523,000 bushels; total farm value, \$10,102,000. Oats, acreage, 1,338,000 acres; yield per acre, 34.5 bushels; production, 46,161,000 bushels; total farm value, \$19,388,000. Barley, acreage 78,000 acres; yield per acre, 28.3 bushels; production, 2,207,000, bushels; total farm value, \$1,545,000. Rye, acreage, 170,000 acres; yield per acre, 18.3 bushels; production, 3,111,000 bushels; total farm value, \$2,302,000. Potatoes, acreage, 438,000 acres; yield per acre, 102 bushels, production, 44,676,000 bushels; total farm value, \$21,444,000. Hay, acreage, 4,811,000 acres; yield per acre, 1.32 tons; production, 6,351,000 tons; total farm value, \$87,009,000

The area under tobacco is 6,000 acres; the yield about 7,050,000 pounds. Beet sugar is produced. The farm animals in 1910 comprised 717,000 horses, 4,000 mules, 1,771,000 milch cows, and 889,000 other cattle, 1,117,000 sheep, and 656,000 swine. The wool clip in 1908 yielded 5,100,000 pounds of wool, valued at \$1,158,000. Common agricultural crops are raised, market-gardening, fruit-growing and sugar beet production are pursued

Mining and Manufactures.—Mining and quarrying are important industries. In 1909 the mines within the State yielded 697,473 long tons of iron ore, mostly magnetite, valued at \$2,098,247. The output of talc was 70,739 short tons, valued at \$697,300. The yield of crude petroleum was 1,160,128 barrels, valued at \$2,071,533; the yield of natural gas was of the value of \$959,280. Mineral springs yielded 8,007,092 gallons, valued at \$877,048. The output of granite, trap rock, sandstone, marble and limestone was valued at \$6,137,270; of Portland cement, \$1,813,633; of natural cement, \$441,136. The production of bricks, tiles, pottery, etc., was estimated at the value of \$8,029,224. The output of salt was 9,076,743 barrels, valued at \$2,136,738. The State also produces infusorial earth, emery, garnet, crystalline quartz, and other minerals. The output of pig-iron was 1,019,495 long tons, valued at \$15,879,000. Including pig-iron, and excluding iron ore, the value of mineral output amounted to \$45,669,861. The statistics of the manufacturing industries of New York State at the last census are summarized thus: Establishments, 37,194; capital \$2,031,450,515; salaried officials, 98,012, salaries, \$111,145,175; wage-earners (average), 856,947, wages, \$430,014,851, miscellaneous expenses, \$301,575,788; cost of raw material, \$1,348,603,286; value of output, \$2,488,345,579. Preeminent among the industries of the State is the manufacture of clothing. This factory industry originated in the State about 1835, and by 1880 it was first among the industries of the State. At the last census of manufactures New York held first place among the American States as a producer of clothing; the value of its output of men's clothing formed 47 per cent, and of women's clothing 70 per cent of the total value of products of these industries in the States. The combined textile industries gave an output valued at \$123,668,177. There are nearly 2,000 newspapers and one-third of the books published in the United States bear a New York imprint. New York City ranks as the third shipping port of the world, coming after London and Liverpool. The imports for the fiscal year ending 1909 amounted to the value of \$779,308,944 and the exports to the value of \$607,239,481. The exports consist largely of grain, flour, cotton, tobacco, apples, and other fruits, preserved provisions, cattle, and frozen meat. Most of the great railroad lines which bring merchandise from the west have their terminals on the New Jersey side of the harbor, but there are ample facilities for the transfer of goods to the docks on the eastern side by means of lighters and of barges which carry the loaded cars across. In New York State there are 8,600 miles of railroad, and 4,000 miles of electric railroad track. The canals of the State, used for commercial purposes, have a length of 566 miles, of which the Erie canal has 387 miles



STATUE OF BARON VON STEUBEN.

Fisheries.—The number of persons employed in the fishing industry of New York, in 1908, exclusive of packing and canning establishments and wholesale fish dealers, was 6,775; vessels, 643; value, including outfit, \$1,749,961; boats, 3,131; value, \$307,610; value of apparatus of capture, \$561,808; value of accessory property and cash capital, \$1,412,003; value of products, \$4,593,703.

Government.—The Governor of the State is John A. Dix, salary \$10,000. The Lieutenant-Governor is Thomas F. Conway, Secretary of State, Edward L. Laxansky; Comptroller, William Sohmer; Treasurer, John H. Kennedy; Attorney-General, Thomas Carmody; State Engineer, John A. Benschel. From 1609 to 1664 the region now called New York was under the sway of the Dutch; then it came under the rule of the British, who governed the country till the War of Independence. The legislative authority is vested in a Senate of 51 members elected every two years, and an Assembly of 150 members elected annually. There are annual sessions. The right of suffrage resides in every male citizen 21 years of age, who has been a citizen for 90 days, and has resided in the State for a year preceding the election. A voter must also have resided four months in the county, and 30 days in the election district. The State is represented in Congress by two Senators and 37 Representatives.

Finance.—The sources of public revenue are (1) the general property tax, for county and municipal purposes only; (2) on inheritance tax, for State purposes; (3) corporation taxes, business taxes, fees and licenses, for State, county, and municipal purposes. The general property tax is levied on real and personal property. Real property comprises (for taxation purposes) "special" franchises (mostly railroad, telegraph, and other public service rights), and the tangible property connected therewith. Tax assessors and collectors are elected or appointed locally. New York is the wealthiest, as it is the most populous, of all the States of the American Union. According to the last estimates of the Federal Census Bureau, the aggregate value of all property within the State amounted to \$14,769,042,207, of which the sum of \$9,151,979,081 represented real property and improvements. The bonded debt of New York State for the year ending 30 Sept 1910 was \$57,230,0660. The assessed valuations were: realty property, \$9,266,628,482; personal property, \$554,992,070; total, \$9,821,620,552. The total receipts and expenditures in New York State for the fiscal year ended 30 Sept 1910, omitting transfers in the adjustment of accounts, between the several funds, were as follows: Receipts, \$59,872,316.73; expenditures, \$57,422,290.96. Some principal sources of revenue and purposes of expenditures follow: Tax on corporations, \$9,123,738.60; tax on organizations, \$488,177.76; tax on transfers (inheritance tax), \$8,212,735.61; liquor tax, \$9,589,779.19; stock transfer tax, \$4,635,443.20; sale of highway improvement bonds, \$5,000,000.00. Expenditures, State departments, commissions, etc., \$7,347,533.30; charitable institutions, \$2,943,371.41; hospitals for insane, \$7,683,796.49; educational purposes, \$8,331,623.80; Legislature, \$1,503,764.28; Judiciary, \$1,547,595.21; State prisons, \$1,648,383.86; highway, repairs and improvements, \$7,426,259.82.

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Religion and Education.—The chief religious denominations numerically are the Catholic, Methodist, Presbyterian, Protestant Episcopal, and Baptist. Education is compulsory between the ages of 7 and 16 years. The number of pupils registered in the several classes of schools, at last report was as follows: Common schools, 1,386,712; academies, 42,802; normal schools, 6,494; training classes and schools, 3,579; Indian schools, 870; private schools (estimated) 225,000, special schools, 3,870; evening schools, 132,410; total, 1,801,737. The number of teachers were 37,152. The number of public high schools for the year ending 31 July 1909, were 692 and of private academies 162. The teachers in high schools and academies number 5,117 and the pupils 121,600. There were 30 universities and colleges with 2,699 professors and teachers, and 22,097 collegiate and graduate students. The public high schools, and higher education generally, are under the supervision of the University of the State of New York, not a teaching but an administrative institution, governed by a board of regents chosen by the State Legislature. It includes all the incorporated colleges, academies, and higher departments of public schools; it can incorporate new colleges, may inspect the various institutions, and may confer degrees. Within the State are many sectarian and non-sectarian colleges. The names and number of students in all departments of the chief non-sectarian colleges are approximately as follows: Columbia University, Manhattan, 4,342; Cornell University, Ithaca, 3,734; New York University, New York, 3,452; City of New York College, Manhattan, 1,338; Normal College of the City of New York, 689; Vassar College, Poughkeepsie, 1,001; Syracuse University, Syracuse, 2,993; Pratt Institute, Brooklyn, 3,688; Rensselaer Polytechnic, Troy 609; Adelphi College, Brooklyn, 513. Educational work is maintained chiefly by the proceeds of the Free School Tax levied in counties for common schools, and of the general State tax from which appropriations are made for education.

Charities and Corrections.—The State Board of Charities, a constitutional body (12 members appointed by the Governor with consent of Senate; term eight years), has power to inspect all charitable institutions which receive any public funds, establish rules for reception of inmates, license dispensaries, supervise placing out of children, support and remove State, alien and non-resident poor, investigate the condition of the poor seeking public aid, advise measures for their relief, and collect statistical information. The State maintains in whole or in part 24 institutions for defectives and veterans, accommodating about 9,000. There are 58 county and 7 city and town almshouses; 15 public hospitals; 4 public and 144 private children's homes; and approximately 1,100 other charitable institutions. Superintendents of the poor have charge of the almshouses and poor persons in 61 counties, and decide disputes concerning settlements of poor persons. Overseers of the poor give temporary relief and commit town poor to almshouses. Persons of full age gain a settlement in a town by one year's residence. No poor person may be removed to a different town or county without legal authority, nor foreign poor be brought into the State, under penalty

of \$50. No child under 16, soldier or sailor, may be committed to any almshouse. Such poor as have not resided 60 days in a county within the year preceding application for relief are sent to special almshouses as State poor. Insane poor must be removed to one of the 16 State hospitals for the insane, in charge of the Commission in Lunacy. The State prisons are Sing Sing, Auburn, and Clinton. Others are Great Meadow and the State Prison for Women. During 1909 the daily average number of prisoners was 4,420. At the close of the year there were 4,320 prisoners in the first three prisons, and 631 were out on parole. The total number of prisoners in the custody of the Wardens on 30 Sept 1909, was 4,941. The total expenditures for the care and maintenance of the three State prisons in 1908 and 1909 were \$194,767.63 and \$581,174.44.

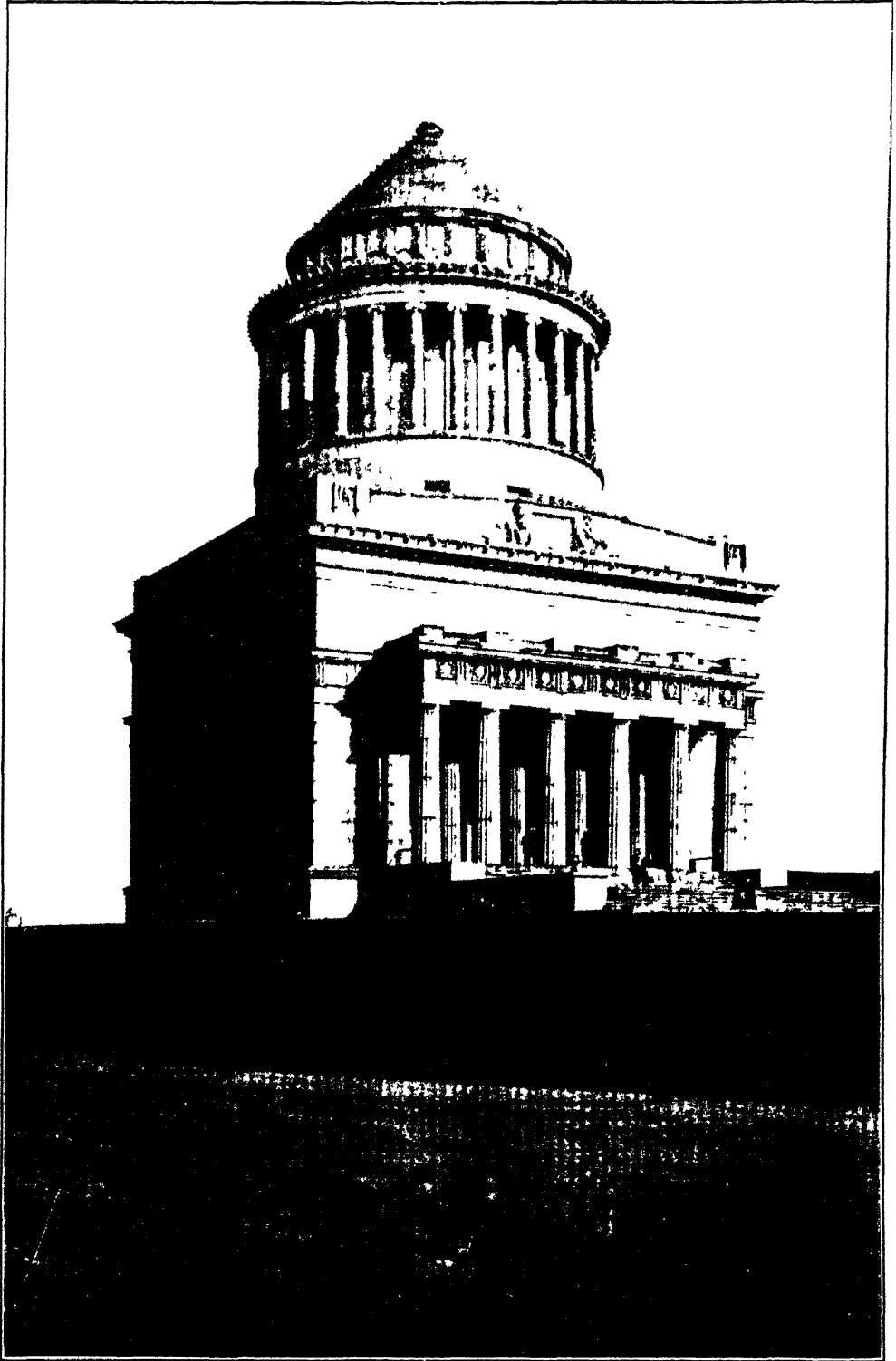
State Legislation.—A regular legislative session was held in New York during 1910. Among other measures relating to agriculture a new act was passed in regard to the care and keeping of cows. In revising its automobile act New York exempted from taxation as property all automobiles except commercial cars. The State fees range from \$5 for cars of 25 horsepower or less to five times that amount for cars for 50 horse-power. An act was passed for licensing and regulating private banking. Both a deposit of \$10,000 with the State Comptroller and a bond with sufficient sureties are required, and the public must have access to quarterly reports of assets and liabilities. The child-labor laws were amended by two acts, so that now no minor under 16 years of age is permitted to work in any mercantile establishment, office, hotel or as a messenger more than 54 hours a week, nine hours a day, or between 7 at night and 8 in the morning. A retirement fund was established for teachers who have reached the age of 70 years and who have been connected with the State educational institutions at least 10 years and have taught 30 years in all. A step was taken towards State insurance of workmen against accidents by permitting the risk of accidents to be voluntarily assumed by the industry. The list of persons to whom the sale of liquors is forbidden was revised and made to include minors under 18, habitual drunkards, Indians, intoxicated persons, inmates of State institutions and persons to whom a dealer has been requested in writing not to sell by some member of the person's family. The legislature, at its regular session, adopted a primary election law which was vetoed by the Governor chiefly because it retained the convention system. A new inheritance tax law and a law permitting the owner of a single bond secured by a mortgage of land in the State, which was recorded prior to the Mortgage Recording Act, to secure exemption from personal property taxation by paying the mortgage recording fee of five mills on each dollar of the bond.

History, 1910.—The predominant event in the history of the year in New York State was the political landslide which swept into greater power than it has held since Cleveland's second election the Democratic party of New York and of the United States. The vote for Governor was Dix (Democrat), 689,700; Stimson (Republican), 622,299; Hopper (Independent), 48,470; Russell (Socialist), 48,529. The vote

polled for Lieutenant-Governor was: Conway (Democrat), 662,630; Schoeneck (Republican), 632,746. An outstanding event was also the flight from Albany to New York made in an heavier-than-air machine by Glenn H. Curtiss on 29 May. The distance, 137 miles, was covered by the aviator in 152 minutes. An aviation meeting was also held at Belmont Park, Long Island, in the course of which several records were broken. Following on the meeting Mr. Allen F. Ryan, who organized it, was elected President of the Aero Club. On 4 Oct. 1910, the exposure by the press of abuses in the management of the State's forest preserve bore fruit when James S. Whipple resigned from the office of Forest, Fish and Game Commissioner, which he had held from 1905. Early in the year, as a result of the public interest aroused in the troubles of the seeker after citizenship, new clerks were set at work in the State and Federal bureaus of naturalization. A widespread sensation was caused on 10 November when Bayard Clarke Fuller, for 19 years Supervising Inspector of Food for New York, was suspended by Health Commissioner Lederle as the outcome of an investigation into the trade in rotten eggs in New York. The facts developed proved that a large trade in the purchase and sale of decomposing eggs, known in the trade as "rots and spots" existed in New York. The fight for new subways in New York City went on and on 10 November, William G. McAdoo, in behalf of the Hudson and Manhattan Company, made a definite offer to equip and operate the \$100,000,000 triborough subway as soon as completed. Other offers were made, notable one being that of the Bradley Company. In Nov. 1909, Attorney-General O'Malley appointed John B. Coleman as a Special Deputy Attorney-General to inquire into the milk dealers' methods. This inquiry was carried into 1910, and the fruit of the investigation was the submitting to the Legislature in April of recommendations by Attorney-General O'Malley, which, if carried into law, would effectively regulate and control all corporations in New York State dealing in food produce and other necessities of life. In May the settlement of the suits against the Metropolitan Street Railway brought in the amount realized in New York City in franchise taxes since 1 Jan. 1909 to \$20,000,000. In March 1910 the governors of the New York Stock Exchange proposed drastic resolutions, resolutions which dealt a strong blow at the group of gamblers among the membership, whose operations had involved the institution in a number of scandals.

New York, N. Y. According to the 1910 census, the population of the city of New York is 4,766,883, of which the boroughs of Manhattan and Bronx have 2,762,522; Brooklyn, 1,634,351; Queens, 284,041; and Richmond, 85,969. The total area of the greater city is 317 square miles; that of the borough of Queens is greatest, 118 square miles, while the populous boroughs of Manhattan and Bronx only have 63 square miles. The greater city has 3,134 miles of streets. Brooklyn has the largest number paved, 718; while Manhattan and Bronx are close behind with 707. The net public debt of the city is \$834,884,126, and the annual cost of the government, \$174,079,335. This makes the per capita cost, 36.50. New York spends \$30,082,972 annually on its schools,

NEW YORK CITY



General U S Grant's Tomb, New York City,
Overlooking the Hudson River.

NEW YORK CLEARING HOUSE—NEW YORK PUBLIC LIBRARY

which have 719,189 pupils, and 17,689 principals and teachers. Manhattan and Bronx have the largest number of pupils, 374,293. The annual cost of the fire department is \$8,187,459. Its membership is 4,337 regular and 2,088 volunteers. The police costs \$15,517,213, and the annual arrests average, 220,334. The force numbers 8,604. New York owns its water works. They cost \$173,600,000. There are 2,545 miles of mains and the average daily consumption of water is 494,000,000 gallons. There are 1,970 miles of sewers. The assessed value of real estate is \$6,600,187,322, and of personalty, \$372,644,825. The assessed valuation of special franchises is fixed at \$465,409,600. The tax rate on real estate in 1910 for the boroughs of Manhattan and Bronx is 1.75790, and in Brooklyn, 1.81499. The annual death rate of the greater city is 17.10, the highest in Richmond borough, 18.40, the lowest in Queens, 15.90. New York's annual birth rate is 27.90. In Manhattan and Bronx, it is 29.10, the highest, while in Richmond it is the lowest, 24.80. The foreign commerce of the port of New York during the fiscal year ending 30 June 1910 aggregated \$1,727,006,057, a gain of \$205,039,967 over 1909. This increase is the greatest since 1880, when that year it amounted to \$278,886,381. New York's share of the total foreign commerce of the United States was for the fiscal year, 1910, 48.45. The gain of New York in merchandise commerce was 50.56 as against 47.01 for the rest of the country. The big steamship companies have applied to the War Department for permission to lengthen their piers on the North River in order to accommodate some of the larger liners now being built. No decision had been arrived at on 1 January. If the application is denied, the future terminal for the ocean steamships may be Montauk Point, at the end of Long Island. From 10 to 19 Dec 1910, the subway carried 8,598,111, and the elevated roads, 8,759,521 passengers. There is much controversy going on at present as to how the future subways should be built. That the need of them is great is conceded. The east side section of Manhattan and Bronx and part of Queens are retarded in their development by the lack of proper transportation facilities. The mayor believes that the Interborough Rapid Transit Company, which operates the present system, should also be the lessee of the future one and be obliged to give transfers from one route to another. In opposition, there is sentiment for an independent subway in three boroughs to compete with the Interborough. During 1910, the Pennsylvania Terminal at 7th avenue and 33d street was completed, as were the McAdoo system of tunnels under the Hudson River. The New York Central has demolished its old station and the construction of the massive new one is now under way.

New York Clearing House. See CLEARING HOUSE, NEW YORK.

New York Public Library, The. This library is administered by a board of 25 trustees, of which number the Mayor, the Comptroller, and the President of the Board of Aldermen serve ex-officio. The executive officer of the corporation is the director (Dr. John S. Billings). Hon. John Bigelow LL.D., is president. Business is prepared for the board by six committees,—the art, circulation, executive, finance, law, and library committees. The

library staff numbers 659 persons, of whom 156 are in the reference department, and 503 in the circulation branches. The work of the library is carried on in 42 branches, of which 33 are in Manhattan, 5 in the Bronx, and 4 in Richmond. Administration of the circulation branches is conducted by the trustees in accordance with contracts entered into between the city and the library on 17 July 1901, and 26 March 1902. Two of the branches, the Astor and Lenox, which contain works chosen primarily for investigation and research, have no books for circulation, all the other branches have books both for circulation and for use within the building.

When the new central building at 5th avenue and 42d street is opened in 1911, the Astor and Lenox branches will be moved into it. Besides the books for scholars now in the present Astor and Lenox branches, the new building will contain a collection of books for home use. Here will be also the administration offices, the traveling library offices, the library for the blind, and in general it will serve as the centre of the whole system. Exclusive of books and collections, it has been erected and furnished by the city at an expense of about \$9,000,000, on ground valued at about \$8,000,000, which is also owned by the city. Running expenses of the building, salaries of employees, and purchases of books, will all be cared for by the library out of its own funds, and without expense to the city. The circulation branches will remain as they are, and will be operated as heretofore.

During 1909, the amount spent from the city appropriation for the New York Public Library was \$630,204.22; from funds owned by the library, \$255,494.21; and the circulation of books for home use amounted to 7,013,649 volumes. The number of people using the reading rooms in the circulation branches was 1,199,626. The number of people using the Astor and Lenox reading rooms was 194,091, and the number of books called for by them was 776,703. There were 1,844,338 volumes in the entire library at the end of 1909. Of the great libraries of the world, the New York Public Library is fourth in size. The Bibliothèque Nationale, of Paris, is first with about 3,000,000 volumes, the British Museum Library second with about 2,750,000 volumes, and the Congressional Library (q.v.) at Washington third with over 2,000,000 volumes.

The new library building was not intended to be a great monumental building which would look as well from one point of view as another and which would be fundamentally an example of pure architectural form. It is described by the architects, Carrère and Hastings, as "modern Renaissance, more or less of the Louis XVI period, with such modifications as the condition and need of our age have suggested." It is designed to face on the avenue of a city, and is essentially and frankly an instance of street architecture, distinguished in appearance rather than imposing. The façade on 5th avenue has poise and character. and the building, being intended for popular rather than for official use, seems to issue to the people "an invitation to enter rather than a command."

The total quantity of constructive marble in the entire building is about 375,000 cubic feet, quarry measure. The general plan is rectangular, 390 feet long on the 5th avenue front. There are four floors besides the cellar. The

sides and front are comparatively low, the top floor being lighted by windows and skylights; while the centre and rear parts, which are in the form of a T, rise much higher and are lighted entirely by windows.

Entering a stately rotunda of white marble walls and stairways, one walks forward to the exhibition room, where a double row of massive Ionic columns supports a heavily carved oak ceiling. Here will be shown special collections from time to time, such as valuable old manuscripts and other treasures of the bibliophile.

The periodicals room is at the front of the building down the corridor at the left of the entrance. Its high wainscot and ceiling are of carved French walnut, and its railings of bronze. The reading room for the blind is on this floor, a small quiet room on the west side of the transverse corridor; also two rooms for technical science books, and one for patent reports. The latter is fitted with a metal stack having a gold-bronze finish, a ceiling of heavily carved oak rafters, and window frames of solid bronze, like all the others throughout the building.

Descending to the basement, by the stairway from this corridor, one comes to the level of the 42d street entrance, where access is obtained directly into the "lending delivery room" of the circulation department. The finish of walls and benches here is exceptionally beautiful and costly, being of gray Sienna marble, with borders of yellow marble inlaid with bronze ornaments, and with bronze fences and gateways.

The newspaper reading room, with noiseless floor of patent cork composition (which is used in many of the rooms), and the children's reading room, are on the west and east sides respectively of the 42d street entrance.

It is from the newspaper room that one may enter the north end of the great stack-room, which extends southward along the west side of the building. This stack is 297 feet long, 78 feet wide, and 53 feet high, and is divided into seven floors, each 7 feet 6 inches in height. This great room is fitted with 63 miles of Sneed shelving. Before being filled with books, it appeared like an intricate forest of metal work, with a narrow runway down the center of each level, approximately 100 yards in length. It has floor slabs of marble at each level, $1\frac{1}{2}$ inches thick, instead of the usual heavy glass. The shelf capacity of the stack is about 2,700,000 books, and that of other rooms in the building is about 800,000, making a total of 3,500,000.

Each second or third floor of the seven floors of the stack-room corresponds with a floor of the building. Communication with the various rooms above is through a delivery room at the centre of the stack, by pneumatic tubes which carry cards, and a small car running on rods which conveys the books.

One can ascend by elevator or stairway from the basement. In the second story are special reading rooms for students and scholars, to some of which access will be given by ticket when a large selection of books is required for continuous use; a room for public documents and one for books on sociology and economics; a lecture room or classroom, with walls of smooth oak paneling, and a low platform; and a rest room for the women of the library staff. The principal rooms of this floor, however, are those at the south front of the building—the administration offices. The trustees' room is one

of the most beautiful rooms in New York. It is finished in carved French walnut, with a great framed panel in the west wall, where a canvas by some famous artist will some day complete the design. On the north wall is a high mantelpiece, above which is a mural sculpture in Carrara marble by Tonnetti, emblematic of high study or wisdom, a figure on the left representing Precision, and one on the right Perseverance. There is much gold leaf on the elaborately designed ceiling, and the floor is of Philippine teakwood. The director's suite of rooms is adjoining. His private office is finished in simple but graceful oak paneling, with *jaspe rouge* French marble at the base of the walls; and his large outer office is fitted with card indexes and built-in filing cabinets of oak. Across the hall, his reception room, designed in Elizabethan style in dark oak, will probably be, used principally for the monthly meetings of the board of trustees.

Several most interesting features of the building are on the third floor. Here is the main reading-room directly over the big stack-room. It is 295 feet long, 77 feet wide, and 50 feet high, and has a seating capacity of 800 to 1,000 persons. It has wall book cases, with galleries, artificial Caenstone walls above, windows on its longer sides, and a ceiling elaborately paneled and decorated. Long reading tables of oak, having marquetry borders of maple and ebony, in which are numbers in ivory indicating the places for readers, occupy the floor space, with the chairs. A delivery desk of carved oak is at the center of the room, connecting with the stack-room below by book lifts and pneumatic tubes.

This reading room is entered, through immense double doors of bronze and of oak, from the catalogue room. Here are extensive card index files and high tables with cork tops on which to place the card trays.

The other library and reading rooms, on the third floor, each appropriate in size for its purpose, are for American history, Americana (rare books and manuscripts), maps, prints, art and architecture, photographs, and music. The 5th avenue side of this floor is largely given over to the two art galleries containing the paintings and other objects of art, so well known to visitors at the Lenox Library.

Plans for the operation of the library have been well considered. The receiving and checking-up rooms are on the first floor, near the 40th street entrance; the printing and binding departments, in the basement; and the cataloging room is on the second floor. The course of a new book on arriving at the library is as follows: Received in the shipping room, it is unpacked and sent to the order room, where it is compared with the bill and checked up. It then goes to the cataloging room, where it is assigned to its place in the classification scheme, and its index cards are made out; then it is taken to the accessions room, adjoining the cataloging room, where it is entered in a day book; and then it is placed on the shelves of the stack-room with books of a similar kind, available for readers. Documents, serials, reports of institutions, music, maps, manuscripts, and works belonging to special collections (such as Jewish, Slavonic, and Oriental), are sent to their proper departments for cataloging. The growth of the library through recent accessions has been great. Indeed, the friendship of the

NEW ZEALAND

public has been demonstrated continuously through many years by the donation of single volumes and collections of exceptional value. The library is notably strong in famous old manuscripts and editions; illuminated and Oriental manuscripts; works on American history; the history of printing; works in the Oriental, Hebrew, and Slavonic departments; and works on the history and illustration of ancient and modern art in all its phases.

New Zealand. The Dominion of New Zealand consists of two principal islands and a number of large and small outlying islands and island groups, lying about 1,200 miles east of Australia. Since 9 Sept. 1907, these islands, officially established as a colony in 1840, have been known as the Dominion of New Zealand.

Area and Population.—The area including all islands is 104,751 square miles, of which the North Island comprises 44,468, the South Island 58,525, and Stewart Island 665. The population in 1909 included 969,316 Europeans, 47,731 Maoris, and 12,340 Cook Islanders; total, 1,029,417. The death rate in New Zealand averages about 10 in every 1,000 persons. The birth rate is about 27 per 1,000.

Government.—The legislative power is vested in the Governor and a General Assembly consisting of two chambers, a Legislative Council consisting of 45 members, of whom those appointed before 17 Sept. 1891 are life members, the others elected for seven years; and a House of Representatives consisting of 80 members elected by the people for three years. For European representation every adult person of either sex, if resident a year in the Dominion and three months in the electoral district, can be registered an elector. At the general election in 1908 there were on the rolls 240,073 men and 242,930 women. For the four Maori members 10,476 votes of natives were recorded, and there were 76 European members in the House.

The Governor, the Right Honorable William Lee, Baron Plunket, took office 20 June 1904. The Ministry consists of 10 members: (1) Prime Minister, Minister of Finance, Postmaster-General, Minister of Telegraphs, Minister of Defence, Minister of Lands and Commissioner of State Forests; (2) Native Minister and Minister of Stamp Duties; (3) Minister of Railways, Labor and Marine; (4) Minister of Education and Customs Immigration; (5) Attorney-General and Minister of Justice; (6) Minister of Mines and Public Works; (7) Minister of Internal Affairs and Public Health; (8) Minister of Agriculture, Minister of Industries and Commerce, and Minister of Tourist and Health Resorts; (9) High Commissioner (in London); (10) Secretary to the Department of the High Commissioner.

New Zealand is divided into counties and boroughs, and the counties are subdivided into ridings. County councils are empowered to constitute road districts on petition being made.

Finance.—The revenue for 1909 consisted of the following items, exclusive of sales and rents of land: Customs, £2,801,248; stamps, including post and telegraph, £1,591,327; railways, £2,918,507; land tax, £604,901; income, £321,044; total, including other items, £8,778,328. The expenditures were, public debt charges, £2,258,365; railways, £2,120,987; education, £874,818; post and telegraph, £806,293; constabulary and defence, £404,630; total, including others, £8,785,-

513. The rate of the ordinary land tax for 1908-09 was 1d. in the pound, on the unimproved value. The amount to the credit of depositors in savings banks in 1909 was £14,065,312, and the average amount on deposit in banks of issue was £21,996,621, which showed an improvement in the financial situation as compared with the preceding year.

Education and Religion.—No State aid is given to any form of religion, 41.51 per cent of the population exclusive of Maoris belong to the Church of England, 22.96 per cent are Presbyterians, 10.06 per cent Methodists, and Catholics, 14.31 per cent. The total Protestants, including Baptists and other sects not mentioned, were 719,087, and there were, in 1906, 1,867 Jews, 1,452 Pagans, and 24,325 who objected to state their religion.

The University of New Zealand is an examining body, with an annual grant of £3,000. The number of graduates admitted after examination is now 1,327. The affiliated colleges are Otago University at Dunedin, with 34 professors and lecturers, Canterbury College at Christchurch with 16 professors and lecturers, Auckland University College with 13 professors and lecturers, and Victoria College at Wellington with 17 professors and lecturers. The Canterbury Agricultural College is a recognized school of agriculture.

In 1909 there were 31 incorporated or endowed secondary schools with 284 teachers and 4,327 pupils. There are also 66 district high schools with 102 teachers and 2,142 scholars. The children in technical day schools numbered 2,000 in 1909. There are 13 educational local boards with 1,300 school committees; 1,998 primary schools with 3,989 teachers, 147,428 scholars; education is compulsory between the ages of 7 and 14. There are 307 private schools with 908 teachers and 18,367 pupils; 7 schools of mines, 4 normal schools, 5 central schools of art, 11 industrial schools with 2,263 pupils, a school for deaf mutes, an institute for the blind, and a special school for mentally backward boys, at Otago. There are 97 native village schools with 206 teachers and 4,217 scholars, and 6 boarding schools for native children, with 103 government scholars; the total expenditures by the government on native schools in 1908 was £33,235, and the total expenditure in 1908-9 upon education of all kinds £1,096,000.

Agriculture.—Two-thirds of the surface of New Zealand may be considered ideal for agriculture and grazing, especially the latter. Sown grasses are grown almost everywhere, the extent of land laid down being over 12,000,000 acres. The area of land under occupation amounts to 38,204,349 acres, and in cultivation, to 15,614,880 acres, of which land under artificial grasses comprises 87.25 per cent, land under grain crops 4.75 per cent; land under root and green crops 7.35 per cent; land in garden and orchard 0.31 per cent, and land in fallow 0.34 per cent. The climate does not reach the extreme of heat or cold, and the range of latitude from 34 to 47 degrees south, secures a diversity of climate making it suitable for all the products of sub-tropical and temperate zones, while its insular position protects it from droughts, even in dry seasons.

In the North Island all the best forage-plants and grasses grow throughout the year with little intermission; stock thrive without the aid

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of roots or other food than that of the pasture. All cereals flourish, especially maize, which grows at the rate of 50 to 80 bushels per acre. Wheat, oats, and barley thrive where the soil is not too rich. Tobacco, hops, sorghum, broom corn, peanut, hemp, China grass, and all the British, Chinese, and Japanese fruits can be easily grown. Oranges, lemons, limes, olives, and vines flourish with ordinary care.

The advent of the freezing process has been the great good fortune of the sheep farmer, who now keeps his flock of breeding ewes for the production of lambs for freezing. This has greatly increased the production of root and forage crops. The Canterbury Plains, the great wheat-growing district of the South Island, extend 150 miles north and south, running inland from the sea for 40 miles and forming an area of over 3,000,000 acres. The average yield of wheat throughout the Dominion is about 31 bushels per acre. Otago and Southland districts produce oats as their principal cereal crop, the yield varying from 40 to 80 bushels. Malting barley of superior quality is grown in Nelson and Marlborough. It is not uncommon to dig from 8 to 10 tons of potatoes per acre. Rape is largely grown as sheep-feed and may be fed off in time for oats or barley. Turnips, mangolds, and carrots are largely grown in some districts. Saving clover for seed is a lucrative industry. Most farmers feed off with sheep in preference to mowing for hay. Growing rye grass for seed is also an important industry. The growing of farm and garden seeds is an industry well adapted to small holdings. 30 bushels of peas per acre is considered a fair crop, while 60 to 70 bushels of beans are often secured. Other crops are Cape barley, winter oats, lucerne, (which yields from three to five cuttings per year and is admirable food for pigs), and tares. The climate makes it unnecessary, at least in the North Island, to house stock during the winter months, and the ground is so level that the double or treble furrow plow may be generally used, thus saving cost in labor.

New Zealand has proven adaptability for the breeding of all classes of sheep, and the staple of New Zealand wool, especially the long wool and cross-bred, remarkable for its freedom from imperfections incidental to countries subject to long droughts and scarcity of feed. The annual output of sheep is now nearly 5,000,000, and has not yet reached its limit.

Horses are profitably bred, for draught and saddle purposes, and the demand for horses for the cavalry service in India is continuous. The dairy industry and the raising of cattle are encouraged by the government, which has prohibited vessels carrying live stock from infected colonies touching at any New Zealand port except under certain conditions. The government is also making efforts to foster the poultry industry.

New Zealand is particularly adapted for small farms, and the government is encouraging the small farmer, both by schools of agriculture where improved methods are taught, and by a department which lends money to farmers on the security of their holdings at a low rate of interest. The policy of the government is to induce the people to settle on the land and become producers.

The country is heavily timbered, and most of the houses are frame built and the furniture made from New Zealand woods. These include

kauri, rimu or red pine, totara, and kahikatea or white pine. The cost of living is on the average lower than in England. Bread is 1 $\frac{3}{4}$ d per pound, beef 5 $\frac{1}{2}$ d, mutton 5d., sugar 2 $\frac{3}{4}$ d., tea 1s 9d, butter, fresh, 1s. 1d., cheese 7 $\frac{1}{2}$ d., and milk 3 $\frac{1}{2}$ d., per quart.

The holdings of from 1 to 10 acres numbered, in 1909, 21,927; those from 11 to 50 acres, 12,560, from 50 to 100 acres, 7,780, from 100 to 200 acres, 10,206, and there were 84 farms of over 50,000 acres.

In 1908 the yield of wheat was 8,773,000 bushels; of oats, 18,907,000; of barley, 1,983,000; and the wool clip was 167,297,679 lbs, of which all but about 5,000,000 lbs was exported. The live stock in 1909 included 363,259 horses, 1,773,326 cattle, 22,449,053 sheep, and 245,092 pigs. Special rates are given on the steamers to persons who can satisfy the High Commissioner in London of their desirability as settlers; this applies to farmers, farm laborers, shepherds, and men able to manage live stock, and to domestic servants.

In 1909 the total exports amounted to £19,661,781, the exports of wool, £6,305,888; of grain, £791,563; of frozen meat, £3,601,364; of butter and cheese, £2,744,770; of gold, £2,006,910, and of kauri gum, £552,698. Most of the trade was with the United Kingdom, Australia, India, and the Pacific Islands. Auckland and Wellington are nearly equal in their share of about one-third each of the total trade; Lyttleton and Dunedin share a little more than one-third between them.

Manufactures and Minerals—The output of the coal mines in 1909 was 1,908,500 tons. The value of the principal mineral products in pounds sterling, in 1908, were: gold, £2,004,925; silver, £175,337; coal, £966,083; kauri gum, £372,798.

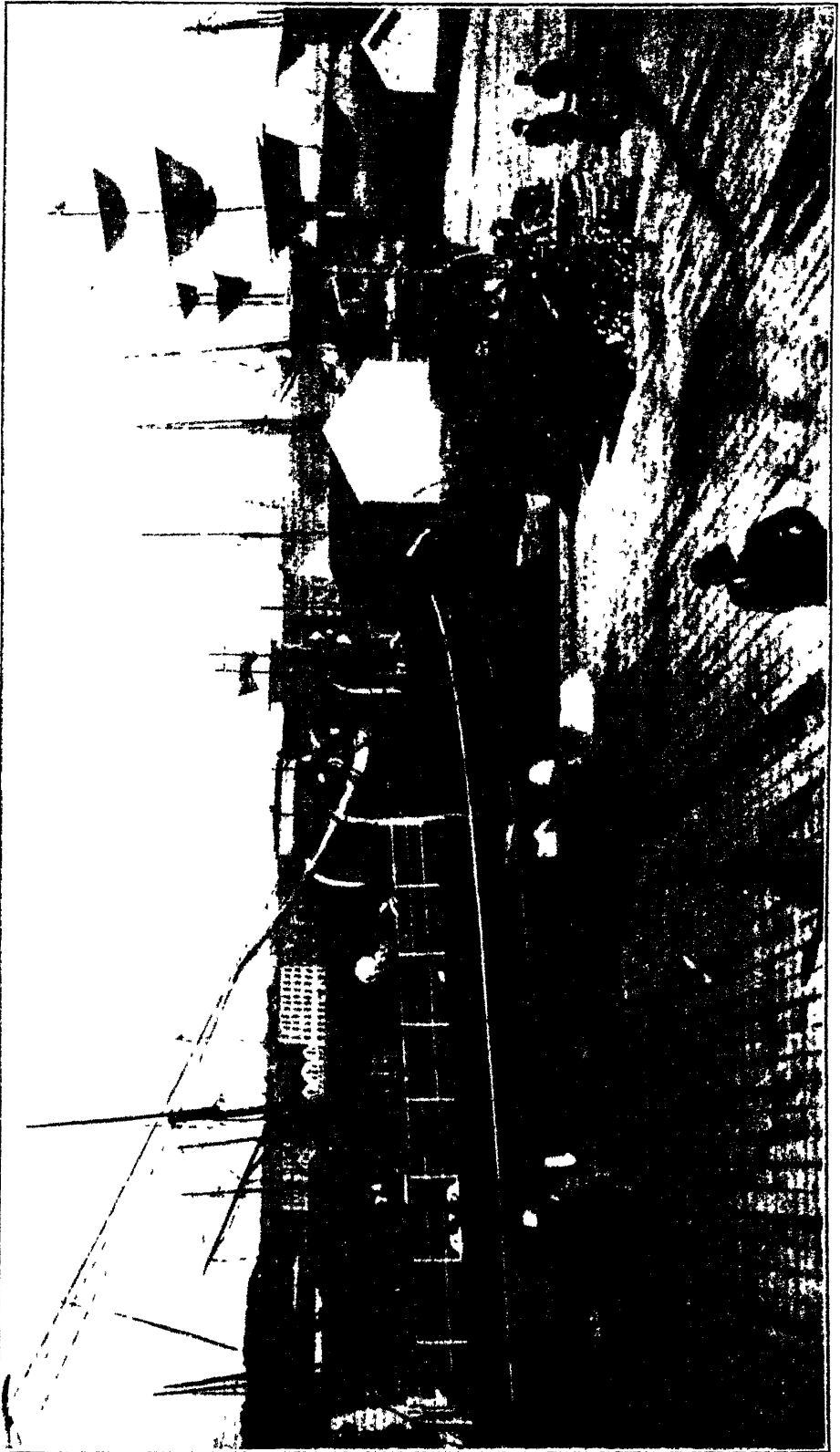
The largest factory industry is that of meat freezing and preserving, capital estimated at £4,928,545, next come the butter and cheese factories, £2,581,639; then the saw mills, £2,128,766; tanning, wool scouring, etc., £1,836,310, grain mills, £1,058,686; iron and brass works, £813,563; clothing and boot factories, £810,008.

Communications—The railways in New Zealand are owned by the State; there are 2,682 miles open for traffic, and the receipts for the year ending March 1909 were £2,929,526. The passengers carried numbered 10,457,144, and the tonnage of goods was 5,135,408. The receipts of the Post and Telegraph Department for the year were £913,995; working expenses £807,652. There were 10,404 miles of line in the government telegraph system, and the number of telegrams for the year was 7,425,693. The telephone is also under government control and the telegraph and telephone revenue for the year was £369,353.

Social Conditions—The Pension Act amended in 1905 and consolidated in 1908 provides for old age pensions, every person fulfilling certain conditions is entitled to £26 a year; the joint annual income of a married couple, including the pensions, must not exceed £90 a year. The average pension is £24 10s 10d. The total pensions on 31 March 1909 were 14,396, representing a yearly payment of £353,343.

History, 1910—The yearly history of New Zealand is important to the rest of the world on account of its experiments in legislation. During the year 1910 activity was chiefly directed toward the breaking up of large tracts

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HARBOR OF AUCKLAND

NICARAGUA

of land for the small farmer under the semi-socialistic laws of the country which make it possible for the poor man to work out his economic freedom, tilling the land he is attempting to earn. This important endeavor, which has been one of the causes of New Zealand's prosperity, necessitated the dividing up of large bodies of crown lands during 1910. For the year 1909 the exports from New Zealand attained the record amount of £110,000,000. This consisted principally of wool and frozen mutton and lamb, which is shipped directly to the London market. In recent years the number of lambs shipped to London has averaged 5,250,000 annually. From a grazing country New Zealand is being rapidly given over to agriculture. In 1910 the country contained 1,029,407 people, of whom 40,000 were Maoris, who have shown themselves amenable to civilization.

The development of the colony requiring more power, the government has turned its attention towards the construction of electric power plants on the mountain streams and in 1910 set aside an annual appropriation of £2,500,000 for this purpose. The government, which is described as "progressive liberal," contains many socialistic features, some of which have proved very successful. Labor arbitration to prevent strikes has long been a favorite tendency and until 1910 it was highly successful. All labor disputes must be submitted to an arbitration board and for a long time this was done with good results, the board of arbitration having been able to satisfy both sides to a certain extent, but a big strike in the mines resulted in an award unfavorable to the miners in 1910 and they struck. According to the law they could have been imprisoned for disobeying the orders of the court, but there were so many it was impossible to imprison them all, and they were of necessity permitted to go free. This has caused a serious setback and has been of grave concern to all other countries where arbitration of labor disputes (q.v.) has been attempted.

A crusade against gambling was started in 1910 on account of the deplorable extent to which it was being carried. To check the activities of the bookmakers, laws had been passed in earlier years on the one hand to license bookmakers, and, on the other, to curb their influence by establishing "totalization" machines. The effect of the license law was, however, to give the bookmakers a better standing in the community and make it possible for them to carry on their practices under the full protection of the law. And the totalization machines gave an opportunity for secret betting, so that these machines alone in 1909 showed that for every person in the colony, including women and children, bets averaging \$10 had been made. In 11 years, while the population had increased only 30 per cent, the amount of gambling doubled. In consequence of this there is a strong movement to enact a law to forbid betting.

Nicaragua. The largest of the Central American countries.

Area and Population.—The area of the State is about 51,650 square miles. The inhabitants numbered, in 1909, about 600,000; approximately 150,000 of this number were Indians, all the rest mixed peoples. There are only about 1,200 people of European blood. There were about 40 births and 15 deaths to each 1,000 of the

1906 population. There are more than 100 urban centres in Nicaragua. The capital town used to be Leon, with 62,500 inhabitants, but is now Managua, on the Managua Lake, 40,000 inhabitants. Other important towns are Granada, 20,000; Matagalpa, 15,750; Masaya, 13,000; Jinotega, 13,900; Chinandega, 10,500; Esteli, 8,300; Matapa, 8,300; Somoto, 8,200, and Boaco, 10,600.

Government and Finance.—The government of the State is military in character. Over each of the 13 districts into which the country is divided, there is a military officer, who has charge of all important matters, such as public instruction, finance, etc. A large area of Mosquito (Indians) land has been made a district, named Zelaya, since 1905; Great Britain, formerly in control of the reserve, granting the right to Nicaragua. The President of the Republic is assisted by ministers of Foreign Affairs, War and Marine, Education, Finance, the Interior, Justice, Public Works, and Police. He is appointed for six years. The Legislature is composed of 36 members, elected by popular vote to a 6-year term. The receipts of the government for 1907 amounted to about \$7,000,000, and the expenditure to \$10,000 more. The revenue for 1908 was estimated at about \$5,760,000. On 1 Jan. 1910, the entire indebtedness of the Republic was \$25,211,075. The value of \$4,000,000 in paper money was in circulation at the end of 1909. The peso (worth 37½ cents) is the monetary unit; silver, and nickel coins are circulating. The Bank of London and Central America, in Nicaragua, has a paid up capital of about \$650,000.

Justice, Education, and Religion.—There are courts for the adjudication of minor matters, and various judicial under-officials, and there is a Supreme Court. Education is obtainable in more than 350 primary schools, 10 colleges, and 2 universities. There is also a museum at the capital. The religion of the State is Roman Catholic.

Products and Industries.—The western portion of the Republic is specially adapted for the production of coffee, which is the most important product of agriculture. The crop for 1908-09 amounted to about 7,150 tons, and for 1909-10 was estimated at 11,150 tons. Germans and Americans are the chief coffee growers. Cocoa is a good crop, particularly in the Pacific coast districts, but is grown chiefly for home consumption. In some localities tobacco does well, but the product is not properly prepared and hence of no value for exportation. The banana crop is very large in the Bluefields region, and sugar is given wide attention. Among the live stock in the country there are about 30,000 cattle. The resources of the forests are great; mahogany, cedar, dye-woods, gums, medicinal plants, and various kinds of valuable timber being extracted. In some of the forests rubber is found, and the product is also being cultivated on both the Atlantic and Pacific coasts of Nicaragua. In several of the eastern districts copper, coal, oil, and precious stones are mined. Gold is the principal mineral product, however, the mines of which are worked by American and British companies. Sugar forms the chief manufacturing interest of the country; the output in 1907 being 3,850 tons. Spirits are prepared; sales of the same being entirely with the government.

NICARAGUA

Imports and Exports.—The total imports into Nicaragua were valued at about \$3,500,000 in 1909. The Nicaraguan exports for that year amounted to \$3,600,000. Among the leading articles of export are coffee, mahogany, gold, rubber, bananas, live stock, and hides. In 1906, 1,401,600 bunches of bananas were shipped to New Orleans. The rubber exported in 1906 weighed about 6,218,000 pounds. About 2,700 pounds of tobacco were exported in the same year. The exportation of gold in 1907 was valued at about \$320,000. The trade of Nicaragua is almost entirely with the United States, Great Britain, Germany, and France. More than half of the exports go to the United States, although there is virtually a "most favored nation" agreement between the Republic and Great Britain. The preponderance of trade is handled by the vessels of two American and two German shipping companies, and passes through the city of Corinto.

Roads and Railways, Posts and Telegraphs.—Taxes of from 50 cents (approximately) to \$5.00 per capita (of males over 18) are levied for the purpose of establishing and keeping up the public highways. Up to the present (1910) the roads of the Republic have been few and inadequate, but roads are now being rapidly constructed between some of the best towns and settlements. Railway lines open extend about 170 miles, and approximately 250 miles of line are under construction. The railway service is supplemented by that of steamers on the lakes and on San Juan River, which are owned by the government (as are also the coasting steamers). Seven of the most important towns are now in touch by means of railways. Government line is under lease to a company until 1920. There are 133 post-offices in Nicaragua. Postal and other communications, in 1908, were as follows: Packets received and dispatched, 8,389,275; telegrams received and transmitted, 1,192,950; messages over the telephone, 47,550. There are about 3,637 miles of telegraph line, and 800 miles of telephone wire; total number of offices, 160.

History, 1910.—On the resignation of General Zelaya, in Dec. 1909, Dr. José Madriz was appointed President of Nicaragua. For several years General Zelaya's rule had caused disaffection among the people and dissatisfaction to those foreign nations whose interests in the country made a stable government important to them. For months there had been friction between the United States and Nicaragua, and on Nov. 1908, Minister Coolidge, representing the United States in Managua, resigned his post. This action was practically a suspension of diplomatic relations. In Oct. 1909, revolution broke out, and on 22 Oct. a battle was fought in the Bluefields district, the rebels being victorious. On 1 Dec. a letter from Secretary Knox to Senor Felipe Rodriguez, the Nicaraguan Chargé d'Affaires, definitely severed diplomatic relations; two weeks later Zelaya resigned and left the country, and the inauguration of Madriz occurred on 31 Dec. The insurgents, feeling that they had some moral support in the American attitude, continued fighting until the government forces were defeated, in the summer of 1910. Managua was occupied by the insurgents under General Estrada, and this general became the controlling force in the government.

The continuance of the revolution for so long a time was a serious drain on the resources of the country, and demoralized most of its industries. Commerce, considering the size of the country, was thriving. With but 600,000 population, Nicaragua exported on an average more than \$3,000,000 a year, and imported as much. The only industry not seriously affected by the war was the banana business, the area devoted to this fruit being in a section controlled from the first by the forces of General Estrada, and firms from New Orleans and its vicinity owned most of the plantations. The mahogany trade has suffered because the Indians, the chief mahogany cutters, have been kept to their reservations by the war. The raising of cattle, horses, and swine was an important industry which has been almost wrecked, both armies having need of the horses for military service and of the other animals for food. All the mines were closed during hostilities, and railways and other lines of communication badly damaged. In Sept. 1910 a special representative of the International Bureau of American Republics reported after a trip through Nicaragua, that it would take at least a year and a half for the people even to begin to recover what they have lost.

In Sept. 1910, Thomas C. Dawson, recently appointed Minister to Panama, was sent to Managua to aid the government in adjusting its disordered finances. Estrada has always shown himself friendly to the United States and there is every reason to suppose that American aid in reestablishing the credit of the country will be welcomed.

On 5 November a series of conferences between the Conservatives and the Radicals was concluded by a convention, authorizing Estrada to continue as President of the Republic for at least two years more. This convention was signed by Mr. Dawson, special United States Commissioner, General Mena, Minister of War, Adolfo Diaz, Minister of the Interior, Fernando Solarzano, Public Works Minister, former President Gardenas, and President Estrada. President Estrada has promised several reforms, chief among which is the concession system, by which monopolies in the necessities of life were established, and which was one of the leading causes of the revolution.

One of the moves made by Estrada was that the bodies of Leroy Cannon and Leonard Groce, two Americans executed by order of Zelaya, in Nov. 1909, be buried with national honors in the cemetery of Granada, and that a marble monument be erected in their memory. All the municipalities of the country are invited to cooperate.

Upon Mr. Dawson's return he reported business and political conditions improving rapidly. Zelaya, who took refuge in Belgium, expressed a desire to return, but it was made known that neither the provisional government of Nicaragua nor the United States would allow him to do so.

On 31 Dec. 1910, a constitutional convention was held, and passed off quietly, Jose J. Estrada being elected President for two years, by unanimous vote. Adolfo Diaz was elected Vice-President for the same period. In his inaugural address the new President praised the government and people of the United States.

NICKEL — NOBEL PRIZES

With continued peace, there seems every reason to suppose that the agricultural, mining, and commercial interests in Nicaragua will rapidly recover their prosperity.

Religious freedom in Nicaragua has been restored as one of the first acts of President Estrada. An edict to this effect was issued in Jan 1911. Some 10 years ago the German Moravian mission schools along the east coast were closed by General Zelaya, on the ground that they were disseminating ideas contrary to those of the government. They have been permitted to reopen.

Nickel. The world's production of nickel declined from 14,000 metric tons in 1907, to 12,800 metric tons in 1908. The production of nickel is confined almost entirely to the United States, Canada, the United Kingdom, Germany, and France. The United States and Canada furnish nearly half the total quantity, and their production has increased, since 1900, more rapidly than that of Europe, as is shown in the following table, in which the quantities produced in the various countries are given in metric tons:

	United Kingdom	Germany	France	United States and Canada	Total
1900	1,400	1,700	1,700	3,000	7,510
1901.....	1,800	1,700	1,800	3,600	8,832
1902.....	1,300	1,600	1,100	4,700	8,739
1903.....	1,700	1,600	1,500	5,100	9,850
1904.....	2,200	2,000	1,800	6,000	12,009
1905.....	3,100	2,700	2,200	4,500	12,500
1906.....	3,200	2,800	1,800	6,500	14,300
1907.....	3,200	2,600	1,800	6,500	14,100
1908.....	2,800	2,600	1,400	6,000	12,800

Nickel has no market in the strict sense of the word. Its price depends on individual agreement and fluctuates greatly. The approximate average price per pound declined from about 48 cents, in 1893, to 32 cents, in 1896, since which date it has fluctuated between 32 and 37 cents.

Niger. See NORTHERN NIGERIA.

Nightingale, Florence, English philanthropist and founder of the modern army nursing system. b. Florence, 12 May 1820, d. London, Eng, 22 Aug 1910. She was the daughter of William Edward Nightingale, of Embley Park, Hampshire. Miss Nightingale early turned her attention to the alleviation of suffering and the condition of hospitals, civil and military, many of which, in all parts of Europe, she visited and studied. In 1851 she entered on a systematic course of training, as a nurse, in the institution of Protestant Sisters of Mercy at Kaiserswerth-on-the-Rhine. The fall of 1854 found her in England, reorganizing the Sanatorium for Governesses, when news came from the Crimea of the terrible conditions in the hospitals following the battle of Alma. Miss Nightingale at once offered her services as nurse, and on 21 Oct 1854, one month after the battle, she sailed for the front with forty companions. Finding hospital conditions in chaos, she totally disregarded military red tape and organized, at Scutari, the great military hospital where her extraordinary gifts of organization, untiring energy, heroism and courage, saved the lives of many thousands of soldiers and won her a world-wide reputation. In spite of sickness and incessant toil she remained on the field until the expiration of

the war, in 1856, when she returned to England with health impaired, but ambition for work unbroken. A testimonial fund of £50,000 (\$250,000) was presented her, every soldier in the army giving a day's pay, but she refused to accept it for herself, devoting it, instead, to the foundation of the Nightingale Home for the Training of Nurses, at St Thomas Hospital. During the American Civil War and the Franco-Prussian War she gave much practical advice and assistance, in the former war the United States Sanitary Commission, organized by women, was largely due to the influence of Miss Nightingale. She it was also who inaugurated the Red Cross movement at Geneva in Switzerland in 1863, which may be well regarded as her most enduring monument.

She has received many honors, among them an election in 1907 to the English Order of Merit, being the only woman upon whom this decoration was ever bestowed. She wrote: 'Notes on Hospitals' (1859); 'Notes on Nursing' (1860), 'Notes on the Sanitary State of the Army in India' (1863); 'Introductory Notes of Lying-in Institutions' (1871); 'Life on Death in India' (1874).

Nihilism. See ANARCHY.

Niton. See RADIUM.

Nitrogen, Atmosphere. See ATMOSPHERIC NITROGEN, FIXATION OF.

Nobel Prizes. The Nobel prize committee of the Storting, Christiania, Norway, awarded the Peace prize for 1910 to the International Permanent Peace Bureau at Berne. The value of the prize is \$40,000. The prize for 1909 was divided between Mr. August Beernaert and Mr. d'Estournelles de Constant, the one a Belgian, the other a Frenchman. The award of 1910 for literature went to the octogenarian German writer, Paul Johann Ludwig Heyse. In 1909 it was given to Selma Lagerof of Sweden. The 1910 physics prize was awarded jointly to Professor Van der Waals of Amsterdam, and Guglielmo Marconi, the discoverer of wireless telegraphy. Johannes Diederick Van der Waals is professor of experimental physics and director of the Physical Institute in Amsterdam. He was born 23 Nov. 1837, in Leyden. He taught in high schools in The Hague and elsewhere, until 1877, when he was made professor in the Amsterdam University. He has written extensively on technical subjects. In 1909 Ferdinand K. Braun, of Germany, won the physics award. The Nobel prize for chemistry was given to Prof. Otto Wallach, of the University of Göttingen. The prize for 1909 went to Wilhelm Ostwald, of Germany. Professor Kossel, of Heidelberg, was the recipient of the Nobel medical prize for 1910. Prof. Albrecht Kossel is in his 58th year. He is a native of Bostock and he studied medicine there and in Strassburg. He devoted himself from his graduation in 1881 to physiological chemistry. He has done much pioneer work in the artificial production of organic material. In 1909 the prize for medicine went to Emil T. Kocher, of Switzerland. The recipients of Nobel prizes between 1903 and 1908 were as follows:

Peace.—William R. Cremer (England), 1903; Institute of International Law (International), 1904; Bertha von Suttner (Austria),

NORRIS — NORTH CAROLINA

1905; Theodore Roosevelt (United States), 1906; Louis Renault (France) and Ernesto T. Moneta (Italy), 1907; K. F. Arnoldson (Sweden), and M. F. Bajer (Denmark), 1908.

Physics—Henri Becquerel (France), Pierre Curie (France), and Madame Skłodowska Curie, 1903; Lord Rayleigh (Great Britain), 1904; Philipp von Lenard (Germany), 1905; Joseph J. Thomson (Great Britain), 1906; Albert A. Michelson (United States), 1907; Gabriel Lippman (France), 1908.

Chemistry—Svante Aetherenius (Sweden), 1903; Sir William Ramsay (Great Britain), 1904; Adolph von Baeyer (Germany), 1905; Henri Moissan (France), 1906; and Edward Buchner (Germany), 1907; Ernest Rutherford (Great Britain), 1908.

Medicine—Niels R. Finsen (Denmark), 1903; Ivan Petrovitch Pavlov (Russia), 1904; Robert Koch (Germany), 1905; Camille Golgi (Italy), and Santiago Roman y Cajal (Spain), 1906; and Charles Alphonse Laveran (France), 1907; Paul Ehrlich (Germany), and Elie Metchnikoff (Russia), 1908.

Literature—Bjoenstjerne Bjornson (Norway), 1903; Frédéric Mistral (France), and José Echegaray (Spain), 1904; Henry Sienkiewicz (Poland), 1905; Giosuè Carducci (Italy), 1906; Rudyard Kipling (Great Britain), 1907; Rudolph Eucken (Germany), 1908.

The Nobel prizes were established from a fund of \$8,400,000 left by Dr Alfred Bernhard Nobel for the purpose of awarding annual prizes to those "persons who shall have contributed most materially to benefit mankind"—chiefly during the year immediately preceding. The prizes are awarded in accordance with the statutes signed by King Oscar of Sweden, 29 Jan. 1900. Each prize now amounts in value to about \$38,000, a considerable portion of the income being absorbed in the administrative expenses and scientific investigations of the committee.

Norris, George William, American politician: b. Sandusky County, Ohio, 11 July 1861. He attended various schools, studied law, and was admitted to the bar in 1883. In 1885 he removed to Nebraska, where he was for three terms prosecuting attorney and, 1895-1902, judge of the 14th Nebraska District. He was elected to five successive congresses, 1903-13.

North America. See CANADA, GREENLAND, LABRADOR, MEXICO, NEWFOUNDLAND, UNITED STATES.

North Carolina. A State of the South Atlantic Division of the United States having according to census of 1910, a population of 2,206,287, a gain of 16.5 per cent. The population per square mile is 45.3. The State has an area of 52,426 square miles, of which 3,670 is water. The capital is Raleigh.

Agriculture.—The running bales of cotton, counting round as half bales and excluding linters ginned to 13 Dec. 1910 were 664,722. The 1909 crop was 633,746 and the per cent ginned was 91.8. The people of the State are mainly engaged in agricultural pursuits. So far as figures are available at this writing, the farm land of the State is in excess of 25,000,000 acres of which about 10,000,000 is improved. The acreage, production, and value of the important farm crops of North Carolina in 1910 was as follows: Corn, production, 57,139,000

bushels, acreage, 3,072,000, value, \$43,426,000; winter wheat, production, 7,433,000 bushels, acreage 652,000, value, \$8,176,000; oats, production, 3,458,000 bushels, acreage 190,000, value, \$2,075,000; rye, production, 150,000, acreage, 15,000, value, \$152,000; buckwheat, production, 95,000 bushels, acreage, 5,000, value, \$76,000; rice, production, 27,000 bushels, acreage, 1,000, value, \$20,000; potatoes, production, 2,314,000 bushels, acreage, 26,000, value, \$1,689,000; hay, production, 262,000 tons, acreage, 175,000, value, \$3,825,000; tobacco, production, 129,600,000 pounds, acreage, 216,000, value, \$13,737,600. North Carolina ranks next to Kentucky as a tobacco-raising State. The farm animals are: horses, 192,000, value, \$23,232,000; mules, 181,000, value, \$24,797,000; milch cows, 297,000, value, \$7,574,000; other cattle, 449,000, value, \$5,612,000; sheep, 215,000, value, \$559,000; sheep of shearing age, 204,000; average weight of fleece 4 pounds, per cent of shrinkage 42; wool, washed and unwashed, 816,000 pounds, wool scoured, 473,280 pounds; swine, 1,356,000, value, \$9,763,000.

Mining and Manufacturing.—The clay products are the most important mineral ones, their value for the last year in which figures were given being \$943,908. Stone is also an important mineral, the production amounting to \$800,177. Mica, monazite, and zircon are also important minerals. The mica production was \$127,870 and the production of the other two minerals, \$37,244. Mineral water, lime, sand lime brick, and soap stone are also mineral products of the State. The total value of these products was \$2,145,947. The capital employed in the manufactures of the State (1909) was \$217,183,000, and the value of the products \$216,614,000. The wage earners numbered 121,470 and the wages paid \$41,257,000. Cotton goods is the most important manufacturing industry. The capital invested in it is \$57,413,418 and the output \$47,254,054. The material used amounted to \$33,025,340 and there were over 36,000 wage earners employed. Tobacco is next in importance, the capital invested being \$36,076,997 and the value of the output \$10,149,351. Lumber and timber come third with \$10,068,358 capital and an output of \$15,731,379.

Fisheries.—There were 9,681 persons employed in fishing and the value of the product was \$1,776,000. The boats used numbered 4,984 of the value of \$251,460 and the vessels, 299, valued at \$281,838. The fishing is done in the sounds of the eastern coast. The most important fish is shad, of which 3,942,300 pounds were caught, of the value of \$372,920. The value of other fish caught was as follows: mullet, \$14,760; alewives, \$140,380; hard clams, \$81,790; crabs, \$34,340; Spanish mackerel, \$34,210; kingfish, \$27,710. There are also to be found in the waters, blue fish, butter fish, perch, black bass, and croaker. The fishing is done in small boats and with seines.

Government.—The Governor is W. W. Kitchin, Democrat, salary \$4,000 per annum, whose term expires in Jan 1913. Some other State officers are Lieutenant-Governor, W. C. Newland, Secretary of State, J. B. Grimes; Treasurer, B. R. Lacy; Auditor, B. F. Dixon; Attorney-General, T. W. Bickett, all Democrats. The composition of the Legislature is: Senate,—Democrats, 43; Republicans, 7; House,—Democrats 99, Republicans, 20. The two mem-



W. W. KITCHIN,
GOVERNOR OF NORTH CAROLINA.

bers of the United States Senate are F. M. Simmons and Lee S. Overman, both Democrats. The Representatives are John H. Small, Claude Kitchin, James M. Faison, Edward W. Pou, Charles M. Stedman, Hannibal L. Goodwin, Robert N. Page, R. L. Doughun, Edwin Y. Webb, James M. Gudger, all Democrats.

Finance.—The total interest and non-interest bearing debt on 1 Dec. 1910 was \$7,239,550, of which \$3,430,000 was in 4 per cent redemption debt bonds due 1 July 1950. Receipts for fiscal year ending 30 Nov. 1910 \$2,880,289.42; disbursements, \$2,993,200.47. The outstanding obligations due amount to \$5,081,285.82. The assessed valuation (30 Nov. 1909) of the real property was \$29,485,184, and the personal, \$298,902,229, including railroads, and the tax rate is \$2.50 per \$1,000. There are 61 National banks, having 22,734 depositors and \$5,282,127.51 in deposits and 187 State banks with 32,868 depositors and \$5,294,433.56 deposits. The depositors in the savings banks number 33,983 and their deposits \$7,233,261.86. There are two private banks with 30 depositors and \$2,309.30 deposits, and four Loan and Trust Companies with 10,145 depositors and \$1,390,734.38 deposits.

Religion and Education.—The Baptists comprise nearly one-half of the total religious denominations. They number 355,987. There are 151,808 members of the Methodist-Episcopal Church, South; 18,271 Methodist-Protestant Church, and 20,805 Methodist-Episcopal Church. The Lutherans, United Synod in the South, number 14,881; Presbyterians, 52,000 and the Roman Catholics, 3,981. The estimated expense of the public schools of the State for the fiscal year 1910-11 is \$550,000. The total expenditures for all schools was \$2,958,160.19. There was raised for each child of school age, as enumerated in the school census, \$3.25; for each child outside of the cities and towns, \$2.59, and \$6.36 for those within the cities and towns. The pupils enrolled numbered 497,716, and the average daily attendance, 308,488. There are about 8,000 school houses in the State, of which more than 7,000 are rural. There are 2,178 colored rural schools and 91 colored city schools. The State has also 15 higher institutions.

Charities and Corrections.—The State institutions comprise The Institution for Deaf, Dumb and Blind, Raleigh, with 352 inmates; the School for the Deaf and Dumb, Morganton, 281; Soldiers' Home, Raleigh, 123; State Hospital, Goldsboro, 716; State Hospital, Morganton, 1,224; State Hospital, Raleigh, 970; and the Tuberculosis Sanitarium, Montrose, 31. The total cost of these institutions to the State is \$1,257,007.10. There are 42 benevolent institutions supported by private associations, 21 of which are hospitals and 15 orphan asylums. There were on 1 Jan. 1910, 706 prisoners in the State's prison, of which 195 were white and the balance colored. The last statement of the prison account was: Receipts \$303,738.02 and disbursements, \$139,038. Most of the receipts were from convict labor in the field in gathering peanuts, cotton and making brick. Under an act of the Legislature, steps have been taken to install a plant for the electrocution of those sentenced to death. Wards have also been added to the dangerous insane department.

Legislation.—The Legislature meets biennially, and the session is limited to 60 days.

The last session at this writing was in 1909 at which acts were passed protecting forests, promoting the cultivation of oysters, regulating the sale of feedstuffs and the packing and sale of fish, appointing inspectors of electric, gas and water meters, requiring seats for female employees, forbidding blacklisting, regulating the practice of optometry and for the free treatment of indigent persons having diphtheria.

North Dakota. A State of the West, North Central Division of the United States having, according to the 1910 census, a population of 577,056, a gain of 80.8 per cent over 1900. The population per square mile is 8.2. The area is 70,837 square miles, 600 of which being water. Bismarck is the capital.

Agriculture.—Under the Federal Reclamation Act, much improved farmland is to be subject to irrigation. The farmland area of the State is in excess of 15,000,000 acres, of which about 10,000,000 are improved. The acreage, production, and value of the important farm crops of North Dakota, in 1910, according to the figures of the Secretary of Agriculture, are as follows: Corn, production, 2,996,000 bushels, acreage, 214,000, value \$1,738,000; spring wheat, production, 36,105,000, acreage, 7,221,000, value, \$32,494,000; oats, production, 11,396,000 bushels, acreage, 1,628,000, value, \$4,217,000; barley, production, 5,428,000 bushels, acreage, 987,000, value, \$2,985,000; rye, production, 128,000 bushels, acreage, 15,000, and value, \$81,000; flaxseed, of which the production was the largest of any State in the Union, 5,778,000 bushels, acreage, 1,605,000, value, \$13,578,000; potatoes, 1,435,000 bushels, acreage, 35,000, value, \$1,306,000; hay, production, 103,000 tons, acreage, 188,000, value, \$783,000. The farm animals on 1 Jan. 1910 were: Horses, 712,000, value, \$81,168,000; mules, 8,000, value, \$1,040,000; milch cows, 247,000, value, \$8,373,000; other cattle, 616,000, value, \$12,628,000; sheep, 621,000, value, \$2,484,000; sheep of shearing age, 275,000; average weight of fleece, 6.5; per cent of shrinkage, 60; wool washed and unwashed, 1,787,500 pounds; wool scoured, 715,000 pounds; swine, 206,000, value, \$2,266,000.

Mining and Manufacturing.—Glacial boulders that are large and sound have been found in great abundance in the vicinity of Minot, North Dakota, a region hitherto devoid of stone. These boulders can be split and trimmed into handsome massive dimension stones. Clay products, coal, and natural gas are other minerals. The last available figures give the bituminous coal production at 268,300 tons, and the value \$563,400. The clay products amounted to \$206,222. The total mineral output was \$738,818. The number of manufacturing establishments in the State were 753, a gain of 49 per cent over 1904; the capital invested, \$11,594,000, a gain of 103 per cent for the same period; the cost of the materials used, \$13,678,000, a gain of 93 per cent; the salaries and wages, \$2,422,000, a gain of 88 per cent; miscellaneous expenses, \$1,201,000 a gain of 135 per cent; value of the products, \$19,150,000, a gain of 87 per cent; value added by manufactured products less cost of material, \$5,472,000, a gain of 75 per cent; the number of salaried officials and clerks, 636, a gain of 115 per cent, and the average number of wage earners employed during the year, 2,795, a gain of 59 per cent.

NORTH DAKOTA—NORTHERN NIGERIA

Much attention has been paid to steam laundries. They numbered 34, their capital, \$445,000, cost of materials used, \$102,000; salaries and wages, \$208,000, value of products, \$548,000 number of salaried officials and clerks, 30, and average number of wage earners employed during the year, 434. Flour and grist milling was another important industry, the capital employed being \$2,383,673, the material used, \$5,426,541, and the value of the output, \$6,463,228.

Government—The Governor is John Burke, Democrat, whose salary is \$5,000 a year, term, two years, which expires 5 Jan. 1913. Lieutenant-Governor, U. L. Burdick, Secretary of State, P. D. Norton, Treasurer, Gunder Olson; Auditor, D. K. Brightbill; Attorney-General, Andrew Miller, all Republicans. The composition of the Legislature is, Senate—Republicans, 44; Democrats, 5. House—Republicans, 87; Democrats, 13. The two members of the United States Senate have not been chosen at this writing. Those whose terms have just expired are, Porter J. McCumber and Asle J. Gronna, both Republicans. The members of the House of Representatives are L. B. Hanna and H. T. Helgeson.

Finance—The bonded debt of the State is \$1,151,300.00. Of this amount, \$94,000 is due in May 1911, and \$20,000 in August. The receipts were \$4,429,223.92, and the expenditures \$4,982,528.32. The valuation of the real property was \$184,589,989, and the personal, including railroads, \$94,004,204. The tax rate is 4.40 per 1,000. There are 133 National Banks, with 4,999 depositors and \$7,005,779.35 deposits. The State banks number 364, the depositors, 16,779, and the deposits, \$5,467,201.14. There are two loan and trust companies, with 1,996 depositors and \$533,315.27.

Religion and Education—According to the last figures available the religious denominations are as follows: Roman Catholics, 30,671 male, and 29,860 female; Lutheran bodies, 25,634 male, and 25,347 female; Methodists, 3,309 male, and 5,807 female; Presbyterians, 4,391 male and 4,148 female. The enumeration of children between the ages of 6 and 20 places them at 143,227. The pupils enrolled number 131,590, the average daily attendance, 90,419, and the number of teachers, 6,364. There are four colleges, having 138 instructors and 1,370 male and 492 female instructors. The tuition fees amount to \$16,122 annually and the total income from this source, productive fund and the government is \$508,541. The value of the buildings is \$1,165,000. The common school fund amounts to \$5,365,722.85.

Charities and Corrections—The charitable institutions of the State consists of 7 private and 1 public hospital, 2 orphan asylums, 3 homes for adults, and a State school for deaf and dumb. The care of the poor is vested in the County Commissioners, who have authority to establish asylums. No one shall be permanently received into the almshouse unless they have resided 90 days in the county. The sending of a pauper into or out of a county is punishable by a fine of \$100. The last available figures gave the population of the almshouse at 236, three of whom were colored. An important step in prison legislation was the passage of an act paroling certain classes of prisoners under suspended sentence.

Legislation—The Legislature meets biennially and its session is limited to 60 days. There was no session in 1910. The one of 1909 enacted laws authorizing the issue of bonds and warrants to secure seed grain for needy farmers, establishing a public tuberculosis sanitarium; fixing the capitol at Bismarck, prohibiting the sale of cigarettes to minors and also soliciting orders or advertisements for intoxicating liquors; providing for sanitation of hotels, establishing a twine plant at the penitentiary and paying a small sum for overtime to convicts; regulating child labor, a pure seed law, authorizing the cities to fix gas rates; providing for a non-partisan judiciary and a legislative reference department.

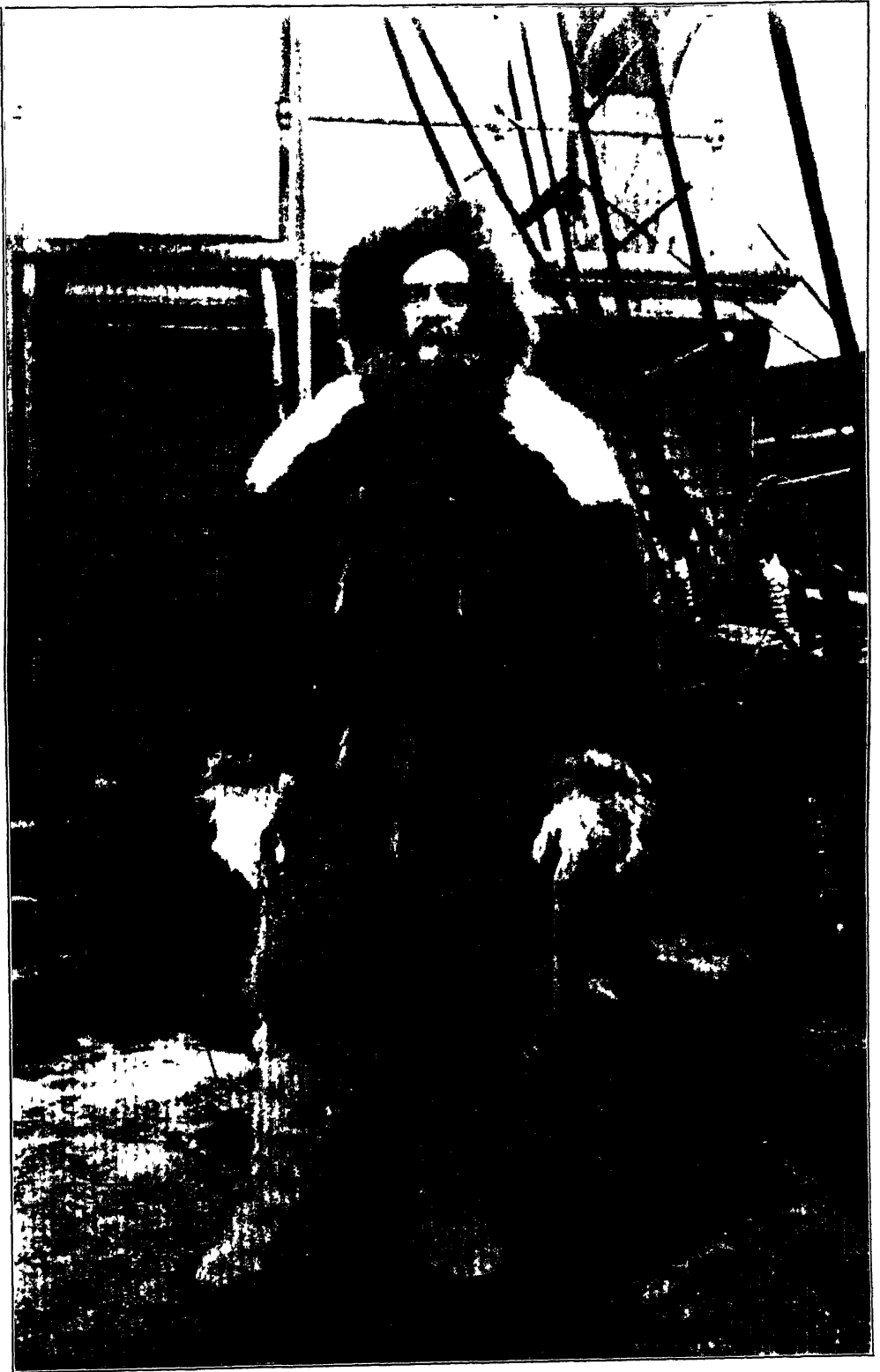
Northern Nigeria. A British Colony on the west of Africa, partially surrounded by German and French West-African possessions, and lying north of South Nigeria.

Area and Population.—The area is about 256,400 square miles, and the population is estimated at 7,164,750. The executive centre of the Protectorate is Zungeru. Slavery to some extent exists, but is being suppressed. About 1,400 bond-men were freed in 1908. The majority of the natives are followers of Mohammed, but there are many pagans, and a few Christians. The Missions in the country have several schools, and work indefatigably for the promulgation of education. The question of public instruction is now receiving the enthusiastic attention of the Government, heretofore inactive.

Government and Finance.—The Royal Niger Company had control of Northern Nigeria before 1900. The country is divided into 13 districts, in each of which there are a Resident and his assistants. As a prerequisite to harmonious administration, native rulers not subservient to the colonial Government have been and are ousted from their minor positions and substitutes appointed. The revenue in 1908-09 amounted to about \$2,622,100, and the government expenditure to \$2,635,400. Of the receipts, Southern Nigeria contributed about \$350,000, and approximately \$1,135,000 came from Great Britain. The revenue for 1909-10 shows an increase over that of 1908-09 by \$175,000. In two of the towns there are branches of the Bank of Nigeria, the circulation of which assists in overcoming the primitive barter-system used in the colony.

Industry, Shipping, and Communications.—The chief products are palm-oil and kernels; rubber, ground-nuts, ivory, hides, ostrich feathers, capsicum, kola-nuts, drugs, and shea-butter. Cotton and tobacco are being experimentally raised. The mineral products include salt in large quantities, and soda; tin-ore, also silver, gold, and iron. Among the industries, stockraising is important. Gin-works are in operation, there are dye-works, and tanneries. The imports into Northern Nigeria are mainly cottons, hardware provisions, and salt; and the exports comprise nearly all the products. Imports were valued at \$1,874,450 in 1907, and exports at \$1,148,000. Trading stations handle the internal traffic; the external passes mostly by caravan to Tripoli, Morocco, and the Saharan Desert. The Government owns a large steamer, 6 stern-wheelers, 5 steam canoes, 1 steam pinnace, 11 barges, and other craft; all of which ply the Niger. English vessels visit

NORTH POLAR RESEARCH



COMMANDER R. E. PEARY.

NORTH POLAR RESEARCH

the colony. There are more than 150 miles of railway line open, and 250 miles more will be completed by the end of 1911. The 400 miles of line will cost about \$6,000,000. There are 250 miles of good road, either completed or under construction, connecting the most important towns. A telegraph line, total length about 2,100 miles, from the Lagos border and Jebba to Sokoto and Maidugeri, passes through the capital, Zungeru.

North Polar Research. The year 1909 was a most eventful one in the history of polar explorations, particularly those of the arctic region. The long and hazardous quest for the North Pole seems at last to have been crowned with success, and, if this were not startling enough, considerable dramatic interest was imparted to the great event by the conflicting claims to the honor of discovery by two rival American explorers, Commander Peary and Dr. Frederick A. Cook—the former claiming to have reached the Pole on 6 April 1909, and the latter on 21 April 1908 (a full year earlier). Accounts of the two expeditions and opinions of scientists concerning the merits of the respective claims of the two explorers, are somewhat as follows:

Robert E. Peary, the veteran polar explorer who had six times sought the North Pole, set out on his last and presumably successful expedition in the summer of 1908. It was planned to start on the long voyage months earlier, but protracted delays on the part of Commander Peary's shipbuilder prevented a start being made before 6 July 1908. On that day the large party sailed from New York.

Peary's vessel was the *Roosevelt*, and his scientific assistants were such distinguished men as Ross G. Marvin, of Cornell, George Borup, of Yale, and D. B. McMillan, of Worcester, Mass. The company included, besides, 66 men and 140 dogs. The entire equipment was the very best, and the plan the ripest the experienced explorer could devise. Five separate detachments, each independently equipped and fully provisioned, were to advance a certain distance to relieve or replenish some one of the various divisions at a point definitely prearranged, and then return. In this way, one division after another having turned homeward, there remained but a single party to make for the goal. The whole worked with the precision and discipline of a well-trained army under a seasoned general.

Sailing from Sydney 17 July and from Etah on 18 Aug 1908, Cape Sheridan was reached on 5 September. There on the shore of the Arctic Sea, the party wintered. Winter camp was broken on 15 Feb. 1909, and the first of the five detachments proceeded toward Cape Columbia. In accordance with the general plan, relieving parties were met and turned back as soon as their purpose was accomplished. Only five men made the final dash to the Pole—Peary, Matt Henson (Peary's colored servant), and three Eskimos. Five forced marches, under unusually favorable circumstances, brought the long-sought-for goal to view on 6 April 1909. The entire distance from mainland to Pole, 475 statute miles, was covered in 37 days, at the unprecedented average speed of 13 miles per day—a feat which in itself would have made the expedition noteworthy.

Observation gave 89° 57' just before the party finally halted. During the 30 days spent there, a temperature of from 12° to 30°F. prevailed at the pole. For the most part, the sky was clear, and, save for the "chalky" whiteness of its ice, nothing whatever struck the expectant observers. As was anticipated, no life of any kind was found at the pole. After making all necessary records and photographs, the party planted the American flag to mark the imaginary pole, and turned homeward.

The homeward marches, greatly favored by paths and stations made in the outgoing expedition consumed only 16 days and were made at an average daily rate of 29.5 miles—more than double that of the outgoing average. The *Roosevelt*, which was used also on the return voyage, reached Cape Columbia again on 23 April 1909. From there the news of the great achievement was cabled to the world. The entire expedition was almost flawless, but two of its participants—an Eskimo and Prof. Ross Marvin—failing to return with the victorious party.

Apart from the momentous discovery itself, considerable data of scientific importance were gathered along the way, of these, the most important were the soundings made at intervals, which furnished the first conclusive proof of the vast oceanic depths north of the American Arctic lands. In addition, the existence of large land masses still unknown has become even more doubtful since this expedition.

Commander Peary submitted to the National Geographical Society such data and proofs as he possessed, and its special committee found in them conclusive evidence that he had reached the North Pole on 6 April 1909. In recognition of his great achievement, numerous scientific societies have awarded him gold medals and otherwise honored this American polar explorer.

Frederick A. Cook, the other claimant of polar attainment, was a Brooklyn physician who had accompanied Peary in an earlier search for the Pole and who has had some other experience as an explorer. He made his dash for the goal rather suddenly, unheralded and unknown to the world. Details of this expedition, however, are somewhat scanty. The more important facts in Doctor Cook's narrative seem to be these: Doctor Cook, having gone abroad, ostensibly on a hunting cruise, with a friend (J. R. Bradley), and finding conditions very favorable for such a venture, suddenly decided to make a bold dash for the pole. Having spent the previous winter at Annotok gathering men and supplies, the start was made from Etah on 19 Feb. 1908. According to his own account, his route lay across Grinnell Land and by way of Nansen Sound. He was accompanied by 10 Eskimos and 103 dogs. Having sent his entire supporting party home before making his final dash, Doctor Cook claims to have reached the North Pole, with but two Eskimos and 26 dogs, on 21 April 1908—a full year, as already noted, before Commander Peary. The entire expedition consumed but two months and the speed averaged the wonderful rate of fifteen miles per day. His return, however, was much delayed by the period of disintegration of the ice, compelling the party to spend the winter on the coast of Jones Sound. This winter-camping in a dugout made on the coast, with-

NORTH POLAR RESEARCH—NORWAY

out ready food or ammunition, is itself regarded as one of the most remarkable features of Doctor Cook's record.

The moment he reached civilization, Doctor Cook, like Commander Peary, was honored in ways innumerable. In Denmark, the first country to be reached by the explorer on his return, Doctor Cook was hailed as the discoverer of the North Pole. The King of Denmark feted and decorated him, many Danish scientists admired and praised him, and the University of Copenhagen honored him with a degree.

It was on 21 Sept. 1909 that Doctor Cook made his triumphal entry into New York City. Many thousands of his admirers acclaimed him as the discoverer of the pole, and in Brooklyn, his old home, the welcome of the voyager was one of the greatest enthusiasm. Then ensued a long series of receptions and dinners and lunches, followed by an extended lecture tour. The Board of Aldermen voted Cook the freedom of the city, and a golden key, emblematic of the extraordinary honor, was presented to him with due ceremony.

Quite naturally, this double claim to North Polar discovery—a prize which has eluded so many arctic explorers for generations and which Peary himself has been coveting for nearly 23 years—provoked a great deal of discussion that was not always free from acrimony. The world had hardly grasped the full import of Doctor Cook's announcement, when Commander Peary virtually bewildered it by his own claims, sent by wireless from Indian Harbor within a week of the former. To add to the world's bewilderment, Mr. Peary at the same time warned everyone against taking Doctor Cook at his word, asserting that the latter had never reached the pole. For months the controversy monopolized the attention of scientists and laymen throughout the world, Doctor Cook repeating his claim and Mr. Peary continually denying it. Friends, both had a plenty, and the battle of words helped much to confuse the vital issue.

It was some time after Doctor Cook's triumphant return to the United States that several suspicious circumstances tending to discredit his polar narrative were thought to have been detected. His statements were subject to careful analysis and then pronounced incomplete, inaccurate, inconsistent, and unscientific. On the other hand, the actual proof repeatedly promised and persistently demanded was not forthcoming. Cook's enemies, naturally, interpreted this delay negatively, while his friends kept quoting the explorer's promise to submit all necessary proof to the scientific committee which was to pass on his claims—a committee selected by the University of Copenhagen, to which Doctor Cook had pledged to submit his complete report. Finally the report was ready, and went forth by messenger to Denmark. Almost the same day (25 Nov 1909) Doctor Cook mysteriously disappeared. Before the end of the year, the University of Copenhagen found that the report submitted to it by Doctor Cook contained "no proof whatsoever that Doctor Cook reached the North Pole."

This seemed to have settled the long Cook-Peary controversy, disposing of the physician's claims so far as reaching the pole was concerned. Doctor Cook's discomfiture was complete. The fall was as great and as sudden as

the rise. He was promptly denounced as a pretender, a plagiarist, an incompetent falsifier. His enemies ridiculed him, his friends disowned him, and scientific societies expelled him. The man was proclaimed the most colossal liar of the age—who had perpetrated the most stupendous fraud upon his generation. Nothing seemed to have been left unsaid at the time, and the subject has been generally considered as closed. Only Doctor Cook's mysterious disappearance and his whereabouts engaged the world's curiosity since.

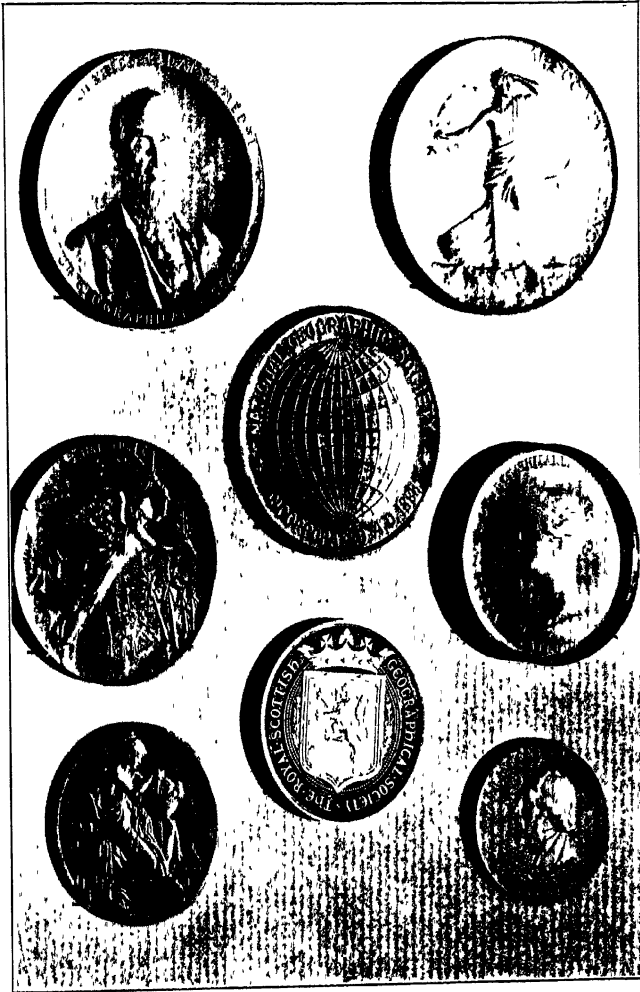
A year went by before anything was seen or heard of the discredited explorer. In an interview granted a newspaper correspondent in London on 1 Oct 1910, Doctor Cook explained his sudden flight and his future plans. The former was made imperative, he said, by threatening mental and physical collapse, due to overstrain during the trying months he had been in America on his return from the pole. For a long time Doctor Cook persistently reaffirmed his claims, but finally, in the late fall of 1910, he came forward with a written retraction. In this he said that, influenced by the atmosphere of the waste northland and the crazing solitude, he may have been in error when he believed he reached the pole. If the American people were unanimous in the opinion that he was mistaken, he averred that he was willing to abide by their verdict. This for all time disposed of any vestige of a claim to original discovery which Doctor Cook may still have retained.

At the same time Commander Peary's achievement is being questioned. Several scientists of international reputation have recently expressed doubt. Professor Galle, for instance, Royal Geographer of Germany, is quoted as saying that Peary never got beyond latitude 89° 2'. Captain Osborn, of the Arctic Club, asserts that he will prove Peary's Polar observations absolutely inconclusive evidence of his having reached the Pole. Both authorities feel sure that Mr. Peary did not possess instruments requisite to determine his position astronomically and that he did not have the necessary scientific knowledge for doing so. The famous Danish explorer and astronomer, Kneud Rasmussen, is also of the opinion that "no living explorer nor Esquimaux has been within 100 miles of the North Pole," and that "neither Cook nor Peary has a shadow of truth in his claims." These are most recent expressions on the subject. A number of scientists are even now (Dec 1910) investigating Commander Peary's proofs.

Norton, Charles Dyer, Secretary to the President. b. Oshkosh, Wis., 12 March 1871. He is the son of a congregational minister; graduated from Amherst College in 1893. After two years work on *Scribner's Magazine*, he entered the employ, in 1895, of the Chicago office of the Northwestern Mutual Life Insurance Company, became assistant general agent in 1897, associated general agent in 1899; general agent 1905. On 5 April 1909 he was appointed by Secretary McVeigh to the post of assistant secretary of the Treasury. On 1 June 1910 he was made Secretary to President Taft.

Norway. Norway is a monarchy which occupies the western and northern part of the Scandinavian Peninsula in the north of Europe.

NORTH POLAR RESEARCH



MEDALS AWARDED COMMODORE R E PEARY,
In Recognition of his Discovery of the North Pole (Reverse)

NORTH POLAR RESEARCH



MEDALS AWARDED COMMODORE R E PEARY,
In Recognition of his Discovery of the North Pole (Obverse)

NORWAY

While Norwegians and Swedes are often confounded, in the minds of those unfamiliar with the natives of these countries, the two kingdoms have for the greater part of their history been independent of each other, and the national character of Norway is quite distinct from that of Sweden.

Area and Population.—The area of Norway is 124,129.7 English square miles, and its population in 1909 was 2,352,786. It does not vary greatly from year to year, except as emigration to the New World removes some thousands yearly, varying from 26,784 in 1903 to 8,497 in 1908; the excess of births over deaths was in 1906 30,102, which is about the average. Thus the population increases rather than decreases in the long run.

About 72 per cent are domiciled in rural districts. In 1900, 2,156,701 of the people were born in Norway, 49,662 in Sweden, 3,775 in Denmark, 2,182 in Finland, 2,787 in Germany, 909 in Great Britain or Ireland; the number of Lapps was 19,677 and of Finns 7,777, total population in that year, 2,240,032. The average population per square mile is about 18.

The largest city is Christiania, with 227,626 inhabitants; next comes Bergen with 72,251, and then Trondhjem with 38,180 and Stavanger with 30,613. Eighteen other towns have more than 5,000 inhabitants.

Government.—The Constitution of Norway, called the Grundlov, bears date 17 May 1814, and by it Norway is constitutional and hereditary monarchy. The succession is in direct male line in the order of primogeniture. In default of male heirs the King may propose a successor to the Storting, but this assembly has a right to nominate another. From 1814 to 1905 Norway and Sweden were united, but on 7 June 1905 Norway declared this union dissolved and later Prince Carl of Denmark was formally elected King. He rules under the name of Haakon VII. He was born 3 Aug. 1872, married, 22 July 1896, Princess Maud, daughter of the late King Edward of England, and has one son, Prince Olav, born 2 July 1903.

The legislative power of the realm is vested in the Storting; the royal veto may be exercised twice. There are two houses, the Lagting and the Odelsting; together they have 123 members, the former comprising one-fourth of the members.

The Council of State is composed of one Minister of State and at least seven Councilors; at present there are eight, viz: Minister for Foreign Affairs, for Worship and Instruction, for Justice, for Commerce, Navigation and Industry, for Agriculture, for Labor, for Finance and for Defence.

Finance.—The financial condition of Norway in the year ending 31 March 1909, was as follows: Revenue, 144,588,364 kroner; expenditures, 137,459,221 kroner. The public debt in that year amounted to 329,304,529 kroner.

Army.—See ARMIES OF THE WORLD.

Navy.—See NAVIES OF THE WORLD.

Education and Religion.—The school age is from six and a half in town, and seven in the country, to fourteen, and education is compulsory. In 1906 there were 5,961 public elementary schools with 271,401 pupils in the country, and 2,773 classes with 89,630 pupils in towns; the amount expended on both was \$3,294,150, of

which \$1,079,150 was granted by the State, and the rest provided locally. There are 92 secondary schools, of which 14 are public, 51 communal, 27 private, and which have 16,527 pupils. Most of the secondary schools are mixed; 13 of the private schools are for girls alone. There are also 112 communal and private schools with 4,048 pupils. There are 6 public and 4 private normal schools, with 969 students. The University of Christiania was attended in 1908 by 1,548 students, it had its own income, \$23,450, and a State subsidy of \$210,950. In addition to the public school education, which is very thorough, many of the young men of well-to-do families spend an additional time on the Continent for the purpose of perfecting themselves in languages, and an educated Norwegian usually speaks at least two languages besides his own, fluently and correctly.

There are 10 schools for the deaf, blind and feeble minded, and 8 reformatory schools for neglected children. The number of children in these, in 1908, was 344 boys and 80 girls. There are 4 communal compulsory schools maintained for children neglecting the ordinary school.

The national Church, endowed by the State, is the evangelical Lutheran; its clergy are nominated by the King. All religions except Jesuits are tolerated. In 1900 there were 1,959 Roman Catholics, 10,286 Methodists, 5,674 Baptists, 501 Mormons and 175 Quakers.

Agriculture. At the last census the number of persons engaged in agriculture was 413,657 males and 238,740 females; this is the main industry of the country. The problem of the Norwegian farmer is a peculiar one, owing to the fact that 75 per cent of the total area of the country is unproductive, and 21.5 per cent forest. There are about 250,000 farms. The nature of the country, which is penetrated nearly everywhere by fjords or inlets, is responsible both for the large per cent of unproductive area and for the fact that the occupants of the farms make a very comfortable living as a rule. The Gulf Stream makes the climate far milder than it could otherwise be in that latitude, and the bits of land available are carefully tilled, with a degree of thrift nearly incredible to the foreigner, every bit of produce being utilized in some way or other. The average annual produce in hectolitres per hectare is, wheat, 21.7; rye, 24.1; barley, 27.8; mixed corn, 33.1; oats, 34.3; peas, 19.8; potatoes, 226.4. It will be seen by comparison with the crop statistics of other countries that this is a very fair yield for a region in that latitude.

In 1908 there were in the country 172,468 horses, 1,094,101 cattle, 1,393,488 sheep, 296,442 goats, 318,556 swine and 142,623 reindeer.

The number of persons engaged in cod fishery is 85,187; in summer herring fishery, 15,186, and in mackerel fishery, 5,268. The value of the fisheries in 1907 in Kroner was: cod, 20,182,900; herring, 10,013,200; mackerel, 782,700; salmon and sea trout, 992,200; other fisheries, 6,240,900; lobsters, 835,000 oysters, 7,700; total, 39,054,400. The mackerel fisheries in the North Sea, the bank fisheries off the coast, and the whale, walrus, sea and shark fisheries in the northern sea, produced in 1907 a total of about 10,710,000 kroner.

NORWAY—NOVA SCOTIA

The total area covered with forests is estimated at 26,230 square miles, of which 75 per cent is under pine trees. The State forests occupy about 2,950 square miles.

Exports and Imports.—The imports consist mainly of foodstuffs, clothing and other products of which Norway does not produce enough for her own consumption, the largest exports are timber, to the amount of some 75,000,000 kroner, malty food, 68,000,000 kroner, and paper manufactures, 17,000,000 kroner; wood pulp is an important export, and also minerals and metals unwrought.

Manufactures and Minerals.—The total value of mineral products in 1907 was 10,834,000 kroner; of furnace products 3,135,000 kroner. These values are nearly three times what they were in 1897. The chief mineral products are silver, copper ore, pyrites, iron ore, apatite, feldspar; of the smelting products in 1907 silver was valued at 510,000 kroner and copper at 2,455,000 kroner, there were 60 mining establishments employing 6,331 persons, and 6 smelting furnaces with 258 persons.

The manufactures are not considerable. There is a great deal of handicraft done in the cottages for family or local use, and home-spun and home-knit clothing have not gone out of existence in Norway.

Communications.—The kingdom in 1910 had 1,849 miles of rail, 292 miles of which were privately owned. The receipts for the three-fourths of a year ending 30 June 1909, were, from State railways, 22,599,484 kroner, companies, 4,176,700 kroner. The expenses were, State railways, 16,904,000 kroner; companies 3,066,800 kroner. The passengers carried by the State railways numbered 9,696,102, with 3,908,363 tons of goods; by companies, 1,402,237 passengers, and 1,100,858 tons of goods.

There were, in 1909, 11,725 miles of telegraph line, and the number of paid messages were 2,774,435, through 1,052 State telegraph offices.

The Norwegian mercantile marine in 1909 comprised 5,741 sailing vessels, of 721,905 tons; 1,645 steam vessels of 846,588 tons; 1,164 motors, 9,166 tons; total number of vessels, 8,550. The total number of vessels entering Norwegian ports in 1907 was 4,402,461; clearing, 4,422,323. Kristiania gets the lion's share of these, with Fredrikstad a close second, then come Bergen and Trondhjem. Kristiania, however, is far the most important port.

Social Conditions.—In 1906, 2,574 persons were convicted of crimes. The Norwegian character is remarkable for one particular virtue honesty. The traveller rarely suffers from theft of any of his belongings, in fact, in some parts of Norway one may leave his possessions beside the road and come back to find them perfectly safe. Public opinion is very severe in condemnation of any form of dishonesty or dishonorable dealing. There is not the luxury in Norwegian homes of the best class which one may observe in other countries; comfort, cleanliness and picturesque beauty are characteristic of them, and the natural thrift of the people makes them equal to evolving comfort out of very small resources. They are fond of music, dancing and social recreations, while possessing a native endurance and courage which makes them able to endure great privation and solitude. Travellers in Norway are apt to be

enthusiastic both over the beauty of the country and the character of its people.

History, 1910.—Within a few years Norway has begun a national agitation for the increase of its merchant marine, which has resulted in the organization of a steamship company purposing to run large and fast vessels between Christiania and New York. At present 90 per cent of the foreign trade of the United States is carried in foreign bottoms, principally English and German vessels. Norway has handled merely the fruit or coarse cargo trade. American tourist traffic in Norway has been considerable, but it has all gone by way of English or German ports. Norway is now making a definite attempt to capture some of this profitable trade for Norwegian lines, and to this end has interested foreign-born citizens in America. Even in the American merchant marine a good many of the sailors and some of the captains are Scandinavians.

Nova Scotia. One of the Maritime Provinces of (eastern) Canada; the illustrious "Land of Evangeline"; a peninsula adjoining New Brunswick Province.

Area and Population.—The Province, including Cape Breton Island, is 20,600 square miles in extent. The population is about 459,600. Halifax is the capital, population 50,000. Sydney is a brisk town; inhabitants 16,000. Then there are Glace Bay, with 17,000 people, Amherst, 9,000; Pictou, 3,300, Yarmouth, 7,500, New Glasgow, 7,000, Windsor, 3,500, Sydney Mines, 5,000, and Lunenburg, 3,000.

Government.—The Provincial Government is characteristically Canadian. There are a Lieutenant-Governor, Executive and Legislative Councils (21 members), and a Legislative Assembly (38 members). The revenue for 1908 amounted to about \$1,485,950, and the expenditure to \$1,538,200. The public debt in that year aggregated \$3,690,850.

Religion, Education, etc.—Public and High schools, and Colleges exist. Instruction was given in 2,535 schools in 1908, with 2,720 teachers and 102,100 pupils. Government-grant amounted to about \$1,147,000 in said year. Adherents to the Roman Catholic religion numbered 129,600 in 1901; Episcopalians, 66,100; Presbyterians, 106,400; Methodists, 57,500; Baptists, 83,200; besides other religionists. There are a Superior Court and courts of lesser jurisdiction, as well as magistrates, appointed by the Province, and justices of the peace.

Agricultural and Industrial Resources.—Cultivable land in the healthy and picturesque peninsula is about 10,000,000 acres in extent. There is no more fertile soil than that of the Annapolis Valley. In 1908 crops were grown on 892,900 acres; there were 1,282,050 acres of pasture; and gardens and orchards utilize 54,050 acres. One of the great products and resources is fruit—apples principally. The apples grown around the Basin of Minas and in some of the valleys, are world-famous. Hay is the most valuable crop; it is grown on about 2,500,000 acres and the yield is approximately 1,000,000 tons. The stock-raising industry is fairly prosperous. The mining industry is very valuable, coal being excavated in large quantities. The output in 1908 weighed more than 6,299,280 tons. The fishing industry is a great resource; among the fish caught there are cod,

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NORTH CAPE

lobsters, mackerel, haddock, herring, halibut, and salmon. There are sufficient wild and fur-bearing animals to justify large annual hunting-excursions. Bears, foxes, moose, deer, otter, mink, sable, muskrat, hares, racoons, and squirrels are among the game. And there are feathered denizens of the woods of various kinds. The industrial manufactures comprise 900 establishments, employing 24,250 individuals, paying yearly salaries and wages aggregating \$9,284,850, and producing the value of \$32,574,300 in manufactures. There are cheese factories and creameries.

Trade, Communications, Banks, etc.—Nova Scotia imports numerous articles of food and wear from Great Britain, the United States, and other countries. Rough materials are exported in large quantities, and find a market in the British possessions, the United States, South America, etc. The imports entering at Halifax in 1909 were valued at \$3,608,400, and the exports leaving that port at about \$10,015,500. Halifax is a great harbor; perhaps the best natural harbor in the world. European vessels call at the port en route, and the home shipping is of national significance. Railway, telegraphic and telephonic communications are up-to-date in the Province. The Intercolonial Railway runs from Halifax through to Montreal. There is rural delivery of the mails. The Bank of Nova Scotia is one of the strongest in Canada, and has branches throughout the Dominion. "Acadie" has scarcely yet realized its resources.

N-Rays. The history of the N-Rays forms a very curious and important chapter in the history of science. Within a few years they were "discovered," experimented upon, their existence apparently proved; and finally disproved. A fierce controversy raged for several months regarding them. Perhaps the most interesting thing in this connection is that a number of leading scientific men, in Europe and elsewhere, apparently saw, and experimented upon, rays which had no existence in reality. They were, in other words, constantly hallucinated,—by a very simple form of hallucination—a thing apparently incredible, yet true. A brief history of this incident is well worthy of record.

It was in 1903 that Professor Blondlot,—a French physicist of repute,—observed, while investigating the Rontgen rays, some effects which he attributed to a hitherto unobserved kind of radiation, having a vibratory character like light and heat, and to which he gave the name of N-Rays. He even thought a little later that he could, by suitable arrangements, measure their wave-length approximately. They emanated, according to his observation, from a variety of sources, among others from certain metals and other substances in a state of strain; and presently a physiological colleague, Professor Charpentier, reported that they also emanated from the muscles (when contracted) and the active nerve-centres of living bodies. Many remarkable properties of these rays were reported one after another in the early part of 1904, and hopes were raised that the discovery would prove a source of further knowledge not only to the constitution of matter, but even of the nature of vital processes.

The N-rays were not visible, and the way in which their presence was made apparent to the senses was through the increase in the

brightness of a feeble source of light, such as a very tiny gas jet or electric spark on a surface painted with luminous paint, when N-rays fell on it, or again, by the increased power of the eye to see faintly illuminated objects when N-rays fell on the retina. Naturally physicists all over the world tried to repeat the experiments, but though a few said the effects to be observed were marked and unmistakable, the majority of those who tried could not see the differences described at all. It is true that photographs exhibiting differences in the luminosity of a small electric spark when believed to be exposed to N-rays were offered by Professor Blondlot as proof of the objectivity of the phenomenon; but others failed to get similar photographs under satisfactory conditions, and in any case such photographs would not have gone very far towards proving the existence of rays with the peculiar properties claimed for N-rays. The continued non-success of so many skilled experimenters in repeating the experiments could not but suggest that in the successful experiments enough care had not been taken to exclude personal and subjective elements—to make sure that the observations were in no way influenced by the observer's expectations.

Some of those who had successfully endeavored to repeat the experiments took opportunities of visiting laboratories in which the observations had been made, and when shown the processes were confirmed in their negative conclusions. One of them—an American physicist, Prof. R. W. Wood—published an account of his experiences. The following are some of them. First, he failed to see the supposed brightening of a stream of small electric sparks when the N-rays were concentrated on it by an aluminium lens. His host thought this must be due to want of sensitiveness in his eyes, as the difference was most distinct when the N-rays were intercepted by a hand interposed between its source and the spark. Professor Wood suggested that an attempt should be made, by observing the illumination, to announce the exact moment when his hand was introduced into the path of the rays,—the observer not having other means of knowing whether the hand was there or not. The attempt failed completely; alternating brightness and dimness were announced while the hand was held motionless in the path of the supposed rays, and when the hand was moved the fluctuations observed had no relation to the movements.

He was afterwards shown the deviation of the rays by an aluminium prism which was alleged not only to bend the rays thrown onto it through a slit, but to spread them out into a spectrum. The positions of the deflected rays were detected by a thin strip of luminous paint moved across them which became more brilliant at certain points. Professor Wood was again unable to see any change whatever in the brilliancy of the phosphorescent line as it moved across, and he presently found that the secret removal of the prism (the room was dark) did not seem in any way to interfere with the observations of his host.

A third experiment consisted in showing that circles painted in luminous paint showed more distinctly in the dark room when a steel file—steel being a source of N-rays—was brought near them. Again Professor Wood

could not himself see any effect, though it was said to be very marked, and presently he found that when he held the file so that its body—which should have been an effective screen—was between it and the phosphorescent circles, while he moved his arms toward and away from them, his host still observed the same changes.

The fourth experiment consisted in holding the file so that the N-rays from it fell on the eye, whereupon in a nearly dark room a white clock-face became more distinctly visible than before. Again Professor Wood saw no difference, but he found that his host's observation of it was in no way interfered with by the secret substitution for the file of a piece of wood of similar size and shape.

It is not surprising that Professor Wood, like others, left the laboratory with a firm conviction that the few experimenters who had obtained positive results in the observations of N-rays had been in some way deluded. And while leaving the question whether N-rays have any objective existence at all, it is certain that there was delusion on the occasion of Professor Wood's visit; and that in all probability there was delusion in all other cases also;—and so certain has this since become that to-day no physicist believes in the existence of the N-rays.

It may be profitable to examine, somewhat briefly, the nature of the delusion in this case. Slight variations in sensation, especially on the margin of what we perceive, may and do occur from physiological causes. Professor Blondlot and others concerned were, of course, well aware of this, and the point of their observations was not that variations in apparent brightness occurred, but that these variations, which they described as marked, coincided with an external physical event so constantly as to render the conclusion inevitable that there was a casual connection. What Professor Wood showed was that the variations coincided with the idea of the event as readily as with the event itself. The difference of sensation was, therefore, not purely physiologically caused, nor, on the other hand, a hallucination produced by expectation,—though no doubt it was a hallucination of a simple kind.

It should be noted that before Professor Wood's letter appeared in *Nature*, detailing his experience, Professor Salvioni, of Messina, published some experiments on himself, which led him to suspect that his own previous results had been due largely to auto-suggestion. In December of the same year, Prof. Pierre Weiss, of Zurich, published an account of some experiments, which led him to the conclusion that psycho-physiological causes had operated in his case. Other physicists followed; and soon the N-rays passed out of the field of belief of the orthodox scientific man.

Nutrition. Recent researches have greatly extended our knowledge regarding the intricate problems of nutrition and metabolism generally. At the same time, it has shown us that, whereas many of these problems were before considered comparatively simple, they are now shown to be extremely complex; and that they are even less understood than when less was known about them. The newer facts may thus be said to have both simplified and rendered more complex the theory of nutrition.

The general process of the upbuilding of

the body, of replacement of waste, is known as anabolism, the process of destruction, of breaking down of tissue, is known as katabolism, the whole process involved, including both these operations, is known as metabolism.

For the upbuilding of the body, various substances are required—proteids, carbohydrates (starches, sugars, etc.), and fats. In addition to these, various salts are needful. Water and air are also essential. These constitute the elements of nutrition. The proteids are supposed to be the elements which replace broken-down muscular tissue; while carbohydrates and fats are supposed to furnish the heat and energy of the body—they represent the "fuel."

These substances, when they enter the body, are acted upon by various secretions—the saliva, the gastric juice, the pancreatic juice, various intestinal juices, etc. All this has been known for many years. The newer researches have, however, shown us that there are a number of far more complex substances involved.

Enzymes, which have lately been shown to play so important a part in all digestive processes, are a peculiar class of substances produced by the living cells which constitute the various secreting glands. They are of unknown composition, and are peculiar in that the chemical changes they induce are the result of what is termed catalysis, i. e., contact. That is, the enzyme or catalyzer does not enter into the reaction, it is not destroyed or used up, but by its mere presence sets in motion or accelerates a reaction between two other substances. There are specific enzymes for specific food-stuffs, for example, the enzyme which acts upon starch cannot act upon proteids or fats, and *vice versa*. Emil Fischer has advanced the theory that enzymes act upon these substances because of their particular molecular grouping; just as a key will only open a certain lock, and none other, so, it is conceived, does the enzyme act upon the particular food-stuff in question.

Prof. Russel H. Chittenden, summarizing these newer researches in his 'Nutrition of Man,' says:

"Today, we know that practically all tissues and organs can, under suitable conditions, undergo autolysis, and in many instances the enzymes themselves can be separated from the tissues by appropriate treatment. Liver, muscle, lymph-glands, spleen, kidneys, lungs, thymus, etc., all contain what are very appropriately called intercellular enzymes. These enzymes are of various kinds. Especially conspicuous are the hydrolytic, proteid-splitting enzymes, which behave in a manner quite similar to, if not identical with, that of the digestive enzymes of the gastro-intestinal tract, i. e., pepsin, trypsin, and erepsin. Further, there are other hydrolytic cleavages taking place in tissue cells such as the cleavage of fats, due as we now know to intercellular enzymes of the lipase type, and by which neutral fats are split apart into glycerin and fatty acid. Again, there are, in many organs, intercellular enzymes which act upon the complex neucleoproteids of the tissue, causing them to break apart into proteid and neucleic acid, the latter being further broken down by other enzymes, with liberation of the contained nuclein or purin bases. Many other chemical reactions are brought about by specific enzymes of various kinds, present in the cells of particular glandular organs. Thus, intercellular

enzymes have been found, as in the liver, which are able to transform amino-acids into amides, and still others capable of splitting up amides.

"Equally important, and even more suggestive, are the data which have been collected recently regarding oxidative processes in the tissues of the body. Specific ferments, known as oxidases, are found widely distributed in many organs and tissues, and it is difficult to escape the conclusion that, as intercellular enzymes, they have an important part to play in some, at least, of the formations characteristic of tissue katabolism. As a single example, mention may be made of aldehydase, which accompanies the oxidation of substances having the structure of aldehydes into corresponding acids. Ferments or enzymes of this class are found in the liver, spleen, salivary glands, lungs, brain, kidneys, etc., and they may well be considered as important agents in the chemical formations going on in the tissues of the body."

Thus, instead of the few simple substances, known a few years ago, there are now, it will be seen, many and complicated chemical substances which have been isolated in the various stages of digestion. Thus, during the pancreatic digestion of proteid, the following substances have been isolated: Protoprotose, deuteroprotose, peptone, amino-acids, heteroprotose, etc.

In turn, the amino-acids have been dissolved into: leucin, tyrosin, aspartic acid, glutaminic acid, glycocoll, arginin, lysin, histidin, tryptophan, etc.

When we turn to the decomposition products of neucleoproteids, on the other hand, we have the same complexity and list of newly discovered chemical substances. Thus, adrenin, hypoxanthin, guanin, xanthin, etc., are well known products of this character. Nucleade, guanase, and a renase are enzymes which play a part in the katabolism of certain tissues. Further products of proteid katabolism are creatin, creatinin, methyl guanidin, urea, sarcosin, etc.

Besides this work on the chemical secretions of the body during metabolism, recent investigations have thrown a flood of light on other, associated topics. The experiments of Professor Chittenden, of Yale, have rendered it certain that the older views of nutrition have been at fault, and that we need, in reality, far less proteid than was formerly considered necessary. In order to maintain the nitrogen equilibrium of the body, it is only necessary to ingest about one-third as much as was formerly

believed to be necessary,—according to the modern standard. These experiments were initiated by the experiments of Mr. Horace Fletcher, who attracted the attention of the scientific world some years ago by his views on nutrition and mastication. The experiments of Chittenden, Michael Foster, Irving Fisher, Van Somern, Huggins, and others, have been, in a large measure, due to Mr. Fletcher's experiments and writings.

In the field of nutrition, much of importance has also been done in diet (q.v.) and fasting (q.v.). See also ADULTERATION OF FOODS.

Nyasaland Protectorate, a British Protectorate in Central Africa constituted in 1891 and until 1907 (6 July) known as the British Central Africa Protectorate. It occupies the territory around the South and West shores of Lake Nyassa and extends nearly to the banks of the Zambesi River. Thus, it includes all British Nyassaland, the Shire Highlands and the greater part of the basin of the river Shire. Area, 43,608 square miles. It is governed by the British Colonial Office through an appointed Governor who is assisted by an appointed Executive and Legislative Council, the Governor possessing the power to veto. The Protectorate is divided into 13 districts, each administered by a resident and his assistants. The population consists of about 1,000,000 natives, 500 Asiatics, and 600 Europeans, most of whom reside in the Shire District. The seat of government is at Zomba, but the chief settlement is Blantyre in the Shire Highlands. Other settlements are Port Herald, on the Shire River, Chiromo, Kotakota, Fort Anderson, and Fort Johnson. The country is being opened up and good roads are building in all directions. Considerable coffee is raised, 1,000,000 pounds being exported annually. Tobacco is the crop next in importance. The growing of tea is increasing and the prospects of cotton as a staple product are very promising. The exports amount to over \$600,000 a year, and the imports to considerably more. Besides the above mentioned products, beeswax, chillies, and rubber are sent out of the country. The Portuguese Government has granted a small piece of land at the mouth of the Zambesi as a concession to the British, and the town of Chunde is the port of entry for the Protectorate. From this point steamers go up the Zambesi and Shire rivers to Port Herald. A narrow gauge railway runs from Port Huron to Blantyre and will be continued to Lake Nyassa.

OATS. The oat crop of the world is nearly 3,700,000,000 bushels annually, most of which is produced in Europe and North America, although in the southern part of these continents the crop does not thrive. It reaches its best development in Norway, Sweden, Germany, Great Britain, Canada, and the United States.

The world production of oats in bushels is greater than that of either corn or wheat, but as its weight per bushel is much less, the total production in pounds is smaller than that of either of those crops. The average annual world production of oats for the five years 1905-09 was 3,694,702,000 bushels; of corn, 3,443,169,000 bushels; and of wheat, 3,336,789,

000 bushels. The 1909 crop of the world was about one-fifth larger than that of any of the previous four years, reaching a total of 4,295,865,000 bushels. Russia, Germany, France, and Austria-Hungary were the leading European countries in the production of oats between the years 1905-09. North America produced 1,172,124,000 bushels; nearly four-fifths, or 900,000,000 bushels, of which were produced in the United States.

The oat crop ranks fifth in value among the farm crops of the United States, being exceeded by corn, cotton, wheat, and hay. It is third among the cereals, being exceeded only by corn and wheat.

It is estimated that 1.6 per cent of the total

OATS—OCEAN ENERGY

land area of the United States was devoted to oats during the ten years 1900-09, as compared with 12 per cent during the ten years preceding.

The average acreage and production and the mean yield per acre of oats for the United States for the ten-year period 1900-09 are shown in the following table. The States are arranged according to their rank in production.

State	Acreage	Mean yield		Production
		per acre	Bushels	
	Acreage	per acre	Bushels	
Illinois	3,893,790	31.2	121,107,519	
Iowa	4,059,200	29.5	119,140,836	
Wisconsin	2,347,416	33.3	78,487,509	
Minnesota	2,243,815	31.7	70,784,631	
Nebraska	2,128,438	26.4	55,644,291	
Indiana	1,504,744	29.0	43,012,800	
Ohio	1,285,602	33.2	42,007,577	
New York	1,306,344	31.3	40,797,664	
Michigan	1,161,260	31.6	35,994,019	
Pennsylvania	1,141,057	29.3	33,525,321	
North Dakota	1,044,031	29.7	31,392,559	
South Dakota	951,553	31.6	29,353,752	
Kansas	1,013,902	24.4	24,835,354	
Texas	798,442	27.8	22,712,303	
Missouri	759,245	23.4	17,714,100	
Oklahoma	480,303	29.4	13,872,095	
Oregon	273,214	30.0	8,316,130	
Montana	187,104	43.3	8,286,963	
Washington	103,667	46.3	7,693,716	
Colorado	146,059	35.3	5,208,991	
Kentucky	239,696	21.0	5,053,044	
California	159,061	31.2	5,035,507	
Georgia	291,986	15.3	4,500,511	
Maine	118,952	37.1	4,402,672	
Arkansas	215,173	20.0	4,274,428	
Idaho	99,871	41.7	4,242,563	
Virginia	209,237	17.6	3,598,184	
Tennessee	188,094	19.4	3,588,663	
South Carolina	209,212	17.1	3,564,592	
Alabama	225,032	15.8	3,509,503	
North Carolina	226,458	14.8	3,325,908	
Vermont	81,456	30.0	2,929,547	
West Virginia	94,735	22.1	2,082,669	
Mississippi	116,685	16.7	1,914,119	
New Jersey	66,699	28.0	1,862,924	
Utah	45,642	40.3	1,835,042	
Wyoming	50,153	35.9	1,804,042	
Maryland	38,778	25.1	961,902	
Louisiana	31,042	16.9	523,677	
New Hampshire	14,346	32.3	464,032	
New Mexico	14,951	29.9	460,160	
Florida	31,196	13.5	421,248	
Connecticut	11,156	31.9	354,863	
Massachusetts	7,543	33.1	252,495	
Nevada	6,410	38.2	248,502	
Delaware	5,554	25.3	134,244	
Arizona	2,243	33.0	75,633	
Rhode Island	1,954	29.4	57,745	
United States	29,643,072	29.5	869,953,989	

In an ordinary oat crop about two pounds of straw are usually produced to one pound of grain. Oat straw is more palatable and more nutritious than the straw of any other grain and is nearly equal to corn stover. In addition to its use and value as a feed, it makes fertilizer worth about \$3 a ton.

The five States leading in the production of oats for the ten-year period 1900-09 were Illinois, Iowa, Wisconsin, Minnesota, and Nebraska, the proportion of the total crop produced by each being 13.32, 13.69, 9.02, 8.14, and 6.39 per cent, respectively. In acreage devoted to oats Iowa slightly exceeds Illinois. Wisconsin, Minnesota, and Nebraska follow in the order named. In general, the highest yields are found in the Northern and Western States and the lowest in the Southeastern States.

The highest acre values of the oat crop are found in the New England, Rocky Mountain, and Pacific Coast States. The highest price per bushel is ordinarily found in the South, the low acre value being due to the low yield. In the Central States west of the Mississippi River, where the yield is comparatively high,

the low price per bushel is the cause of the low acre value.

In the ten years ended June 1909, the average yearly export shipment of oats, including oatmeal, from the United States was slightly less than 18,000,000 bushels annually, or about 2 per cent of the crop. The largest single year's shipment during this period was made in the fiscal year ending June 1906, when more than 48,000,000 bushels were exported, while the smallest exportation, less than 2,000,000 bushels, was made in 1904. The imports in this decade were at a maximum in the fiscal year 1909, when 6,691,703 bushels were imported, practically three times the quantity recorded in any previous year since 1865.

In most of the States, the legal weight of a bushel of oats is 32 pounds, but it varies between 26 pounds in Maryland, and 36 pounds in Idaho. In Canada 34 pounds is the legal weight of a bushel of oats.

Oats are valued as a food for man and beast the world over. In the form of oatmeal, the grain is a very nutritious cereal food. Most of the oat crop, however, is used for feeding to stock, particularly to horses.

For many years oats has stood fifth in point of value among the crops of this country, and that position it had no difficulty in maintaining in 1910. The value of the 1910 crop was a little more than \$380,000,000, being exceeded in this respect only by the crop of 1909. In quantity the 1910 crop was a notable one, exceeding one billion bushels for the second time in the history of the country, its precise estimate standing at 1,096,396,000 bushels, which was about 90,000,000 bushels larger than the splendid crop of 1909. The last year's oat crop was 22 per cent greater than the average for the preceding five years. The production of this crop has shifted somewhat into the South Central and Western States in comparison with the national production since 1889. The share of the North Atlantic States has declined from 10.8 to 8.6 per cent, of the South Atlantic States, from 2.9 to 2 per cent; of the North Central States, from 7.7 to 7.2 per cent; while the South Central States gained the difference between 4.7 and 6.5 per cent, and the Western States the difference between 1.9 and 5.7 per cent.

Ocean Energy. Agostino Ravelli, an Italian engineer, claims to have solved definitely the problem of utilizing the energy of the ocean's waves, the greatest force in the world, and one entirely wasted. Signor Ravelli has patented his invention in 22 countries and the Italian naval authorities have reported favorably on it. The inventor says the reason why the energy of the waves has never been harnessed is because everyone has ignored their double force, one proceeding from the height of the wave's crest above the water's level, and a separate force contributed by the body of the wave as it rolls up on the shore. Signor Ravelli's machine for storing wave energy is an inclined plane on a two-wheeled support, which is run into the sea. A mechanical contrivance, the inventor's secret, transfers the waves' energy to a rotary wheel, to which can be affixed hydraulic pumps or dynamos, as desired. A special apparatus stores part of the energy against calm weather. The entire machine is about 19 feet long. It can develop 500 horse power much cheaper, Signor Ravelli

OCEAN GROVE—OCEANIA

says, that any power-developing apparatus that has ever been invented.

Ocean Grove. Ocean Grove (N. J.) is famous as the home of the largest of the summer assemblies. It is noted, among other things, for allowing no trains to stop at its station nor a vehicle of any sort to be driven through its streets on Sunday, for having in its auditorium the largest organ in the world, and for what is probably the largest Sunday school class in the world, the attendance reaching at times to nearly 5,000. Many conferences and assemblies take place during the summer, chief among these the Methodist camp meeting which begins near the end of August and continues 10 days.

About the year 1868 a project had been set on foot by Rev. W. B. Osborn, Dr. Adam Wallace, and other leading Methodists of New Jersey and Philadelphia, to establish a camp meeting on the coast where the doctrine of holiness, a leading tenet of the Methodist theology, would be constantly emphasized. A specific impetus had been given to the movement by the work of the National Holiness Camp Meeting Association, which had conducted an especially successful camp meeting at Vineland, N. J. A remarkable meeting had also been held at Round Lake, in Saratoga county, N. Y., under the auspices of this association, and a few of the supporters of the Round Lake Camp Ground became interested in the plans of the New Jersey workers for establishing a camp ground at the sea shore.

Mr. Osborn tramped the entire New Jersey coast from Sandy Hook to Cape May, searching for the most desirable location for such a purpose. He and Doctor Wallace fixed upon Ocean Grove as the ideal spot, and Mr. Osborn secured an option on a tract of 400 acres there. The land was a wilderness, only one house standing on the site of the present populous summer community of Ocean Grove and the city of Asbury Park. In the summer of 1869 a band of 22 persons, from New Jersey, Philadelphia, and northern New York camped here and discussed the feasibility of carrying out the plan of Mr. Osborn and Doctor Wallace by purchasing the land.

The first religious service held at Ocean Grove was a prayer meeting conducted during this encampment in the tent occupied by Joseph H. Thornley. The first sermon ever preached at Ocean Grove was delivered on Sunday afternoon, 1 Aug. 1869, by Rev. E. O. Howland.

In the following year the Ocean Grove Camp Meeting Association, consisting of 26 members, was chartered by the legislature of the State of New Jersey. This association is self-perpetuating, but is so bound that the original plans and purposes of the enterprise, particularly in the matters of Sabbath observance and the insistence that the doctrine of holiness shall be upheld, cannot be changed. None of the ground is sold, but leased to those desiring to build.

Much of the surprising growth and success of Ocean Grove is due to Dr. E. H. Stokes, the first president of the Association and for more than 25 years its leader. Upon his death in 1897, he was succeeded by Bishop J. N. Fitzgerald, of the Methodist church. During his administration the assembly continued to prosper. He died in 1906, and Dr. A. E. Ballard was elected to the presidency. Doctor Ballard had long been identified with the administration

of Ocean Grove, and has had from the beginning a large share in its development. He was one of the first members of the association, and for many years the vice-president.

The auditorium, seating 10,000 persons, was built during the administration of Doctor Stokes. Besides this chief assembly room are the Young People's Temple, the Tabernacle, and Thornley Chapel. The young people's meetings have long been a striking feature of Ocean Grove. They are held throughout the summer, and reached their present degree of interest and enthusiasm under the leadership of the Rev. C. H. Yatman, who conducted the work for 25 years. Since 1908 the work of the Young People's meeting has been divided between Dr. C. L. Mead and Dr. W. H. Morgan. A remarkable Bible class is held in the auditorium on Sunday afternoons through the entire season, and is conducted by Dr. L. W. Munhall.

In the realm of music Ocean Grove has won a unique reputation. Mr. Tali Essen Morgan, directs the musical activities of the assembly, conducting an orchestra and a choir which at times numbers a thousand voices, and leading the singing of the audiences gathered for public worship. Some of the most famous opera and oratorio singers have been heard at Ocean Grove, and every season a number of the favorite oratorios are rendered. What is said to be the most powerful organ in the world was built in the auditorium in 1908, by Robert Hope-Jones. It is the first organ of its class to be built in the United States. So much attention has been attracted to it, that Ocean Grove has become the birth-place and the meeting-place of the National Association of Organists. Besides the religious and musical services held in the auditorium, there are lectures and entertainments throughout the season.

Oceania. The name formerly applied to the Australasian Continent, but now comprehending, more properly, a large number of Pacific islands, under British, German, and French administration. The British sphere of influence lies in Tonga, and associate islands, governed from the Commonwealth of Australia; and the German New Guinea Protectorate includes German Oceania. The French Pacific possessions are widely scattered. Their total area is estimated at 1,520 square miles. The principal islands are: Society Islands, (Tahiti and Moorea), 650 square miles, 13,250 inhabitants; Marquesas Islands, 480 square miles and 3,400 people; the Tuamotu Islands, population 3,800; the Leeward Islands, the most important of which have a population of about 6,000; the Gambier, Tubuai, and Rapa Islands, area about 120 square miles and population approximately 4,000. The population of all the islands is estimated at about 30,500.

Government, Finance, and Education.—There is a Governor over French Oceania, assisted by a Privy Council. There is also an Administrative Council, composed of the governor of Papeete (capital of Tahiti), the presidents of the chambers of commerce and agriculture, and other officials. The colony cost France about \$40,000 in 1910; the local revenue in 1908 amounted to about \$625,000. At Papeete there are six denominational schools; six primary schools, with about 600 pupils in all; and a primary and normal school.

OCEANOGRAPHIC MUSEUM — OCEAN'S AGE

The Port of Papeete.—The town has about 3,600 inhabitants, 1,000 of whom are French. Shipping entered and cleared in 1908 consisted of about 37 vessels of between 65,000 and 70,000 tonnage. The port is visited about every five weeks by vessels from the United States. There is shipping communication also with New Zealand ports.

Production and Trade.—The land along the island coasts is very fertile, producing coconuts, bananas, oranges, sugar-cane, vanilla, vegetables, and various fruits. The pearl fisheries of the colony are valuable; the natives are somewhat nomadic as a result, following up the industry from island to island. Copra, sugar, and rum are prepared for exportation. The leading imports into Oceania are tissues, flour, and metal work, and the principal exports from the colony include copra, mother-of-pearl, vanilla, coconuts, and oranges. The sterile localities are rich in scenic beauty.

Oceanographic Museum. On 29 March 1910 the Oceanographic Museum of Monaco was formally opened by its founder, Prince Albert I of Monaco in the presence of representatives of various foreign nations. The celebration included a pyrotechnic exhibition and allegorical pageant in the Bay of Monaco, and an honorary performance at the opera, as well as other notable features. The new Museum, which is also a laboratory, is connected with the Oceanographic Institute of Paris, both these institutions, with an endowment of \$800,000, having been presented to the French Government by Prince Albert. The latter is president of the administrative council of the Institute, which includes among its members ex-President Loubet and the famous physicists Calletet and Becquerel. The direction of the scientific work is confided to an international committee, it being Prince Albert's wish to found an institute and laboratory where investigators of all nations could work together for the advancement of the new science of oceanography. A lecture course was also inaugurated at the Institute in 1903. The new museum at Monaco, popularly known as the Palace of the Sea, is built on the side of a steep cliff at the edge of the ocean. On the water side the building is 256 feet high, while the height of the main facade, on the land side, is 148 feet, the difference being traceable to the slope of the cliff. The length of the building, parallel to the water front, is 330 feet. The edifice contains four stories, which contain very high, large, well-lighted rooms. The two lower stories, which are partly under ground, include the aquariums and laboratories, while the upper stories are given over to the exhibition of sounding and other apparatus, and of the rich and varied collections of deep-sea fauna and flora, representing the results of a quarter of a century of exploration. The entire cost of construction exceeded \$1,500,000. Besides the equipment of the building itself, Prince Albert has also placed at its disposal a small steamer, the *Eider*.

Almost every year since 1885 the Prince of Monaco has made a scientific cruise in the Mediterranean Sea, or the Atlantic or Arctic Ocean. A great part of the museum's exhibits were procured by him on the voyages. These oceanographic collections, containing as they do representatives of all known deep-sea fauna, besides being of great scientific value, are of

interest to the non-scientific observer on account of their strange forms, beautiful colors, and peculiar organs of sight and touch. Aside from their scientific and popular value, too, the collections have proved of practical use, particularly in bringing to light the facts hitherto unknown in regard to the feeding habits of edible fish.

In commemoration of the inauguration of the Oceanographic Museum, the Prince of Monaco caused a plaque to be struck in gold, silver, and bronze. The six gold plaques were presented to the president of the French Republic, and the sovereigns of Germany, Italy, Spain, Portugal, and Monaco. One hundred plaques in silver and twenty in bronze were distributed among the other invited guests at the exercises in honor of the opening of the museum. See DEEP SEA EXPLORATION.

Ocean's Age. Within the past few years, several attempts have been made to estimate the age of the ocean by methods not hitherto applied. One of these consists in the estimation of its age from the degree of its saltiness—the method devised by Mr. J. Joly. According to this theory, the ocean is constantly growing more and more salty; the proportion of its mineral constituents are increasing from year to year. Thus, there must have been a time in the history of the ocean when it contained no salt—when it was the product, merely, of rain and constant waterfall from the heavens. This is only what we should expect, from the geological point of view. The salt of the ocean is derived from various sources; from rivers and streams which flow into it, from the action of the ocean's waters in dissolving rock and mineral matter, etc. Mr. Joly believes that the saltiness is derived from the first cause, almost wholly, and bases his estimate upon that idea. Thus, if we ascertain how salt the ocean is this year, and again next year, we shall know the rate of the increase of its saltiness. By calculating in the opposite direction, therefore, it is possible to estimate how long this salt has taken to accumulate; in other words, its age. Mr. Joly's method consists in dividing the sodium content of the sea water by the yearly contribution from the land, which is ascertained by analyzing river waters and gauging streams.

There is reason to believe, however, that this method fails to take certain factors into account. Thus, sodium is largely derived from lime-soda field spars, found in later igneous rocks and archæan rocks. These rocks formed the original surface of the earth, very largely, and the rate of their decomposition depends upon their exposure. A layer 100 feet deep seems to prevent, almost entirely, decomposition from going on. Below this depth decomposition is virtually arrested.

Mr. George F. Becker, writing in *Science* (1 April 1910) says, in criticising Joly's theory:

"In the distant past there must have been a time when a far greater mass of solid rock was decomposed each year than now decays in the whole period; and a limit to this process can now also be foreseen. The total area of exposed massives has surely diminished and will continue to diminish. Climate and temperature may perhaps have been, in the past, much what they are to-day; the rate of chemical denudation per unit area may not have changed considerably, but the most rigid uniformation

could not maintain that the total area of exposed massive rocks has been constant. The inference, that seems unavoidable, that sodium accumulation . . . progressed more rapidly (though possibly not with greater intensity) in the distant past, and will substantially come to an end when a certain very finite layer of surface material has been exhausted."

Joly calculated that the age of the ocean, according to his method, was about 94,544,000 years. Mr. Becker, on the other hand, calculates that its age is between 38,000,000 and 48,000,000 years. It seems probable that 50,000,000 years is a fair estimate, from all available sources of information; and that Mr. Joly's estimate of the earth's age is excessive. It will thus be seen that, instead of the earth telling us the age of the ocean, there is a tendency at present, to calculate the earth's age from that of the ocean.

O'Connell, William Henry, American R. C. archbishop b. Lowell, Mass., 8 Dec. 1859. He was graduated from Boston College A.B. 1881, and studied theology at the North American College, Rome, Italy, 1881-84. He was ordained priest at Rome, 8 June 1884 and was appointed rector of the North American College, 21, Nov. 1895. He was named a domestic prelate in 1897, and on 22 April 1901 was appointed bishop of Portland, Maine. He was consecrated at St. John Lateran, Rome, 19 May 1901 and returning to the United States, he at once entered upon the duties of his diocese, having been installed in the Cathedral at Portland, Maine. He was honored with the title of assistant at the Pontifical Throne in Jan. 1905, and was a special Papal envoy to the Emperor of Japan in 1905, at which time he was presented with the Grand Cordon of the Sacred Treasure by the Mikado of Japan. He was elevated to the archbishopric and named co-adjutor to Bishop Williams of Boston, Mass., in March 1906, his title being archbishop of Constance, and on the death of Bishop Williams, he succeeded to the see of Boston, 30 Aug. 1907.

O'Donaghue, Denis, R. C. bishop: b. Daviess County, Ind., 30 Nov. 1848. He attended Meinrad's College and St. Thomas's Seminary Bardstown, Ky., and was graduated in theology from Grand Seminary, Montreal, Can. He was ordained priest, 6 Sept. 1874 and served as assistant at St. John's Church, Indianapolis, Ind. He was chancellor of the diocese of Vincennes, for 1879-1900; permanent rector of St. Patrick's Church, Indianapolis, 1887-1910; and on 25 April 1900 he was consecrated auxiliary and titular bishop of Pomario. In Feb. 1910, he was appointed as successor to the Rt. Rev. William George McClosky, Bishop of Louisville, who was the oldest Catholic bishop in the United States both in years and in point of continuous service, and who died 17 Sept. 1909.

Office Inventions. See INVENTIONS, OFFICE.

Oglethorpe Statue. A statue was unveiled at Savannah in Nov. 1910, of James Edward Oglethorpe, one of the founders of the Thirteen Colonies. The crowning work of Oglethorpe's long and busy life was the foundation of Georgia. He saw honest and respectable men imprisoned for debt, and set to work to redeem the prisoners by securing their release on condition that they would become colonists in Georgia. He also determined to make Georgia a

refuge for those subjects of European States who were oppressed and persecuted for conscience's sake. Charity for and relief of all human distress, with no thought of personal gain or glory, was the guiding principle of his colony, than which, Southey said, none was ever projected or established upon principles more honorable to its founders. Oglethorpe's dealings with the Indians were probably the most honest and humane in all American history. So long as he had control of it the colony permitted no drunkenness and no human slavery. If Georgia lagged behind other American colonies in material prosperity, it was because these humane and elevated conditions were a handicap to it in its competition with less moral and less scrupulous neighbors. It was Oglethorpe's giving an asylum to the Sayzbürgers and Moravians moreover that led to the coming of the Wesleys and Whitefield to these shores.

Ohio. A State of the East North Central division of the United States, with an area of 41,060 square miles, of which 300 square miles is water. The capital of the State is Columbus with a population of 181,548. The population of the State is 4,767,121, which is an increase of 609,576, or 14.7 per cent, in the past 10 years. The population per square mile is 117. Ohio ranks 4th in population.

Agriculture.—Ohio is extensively devoted to agriculture. The chief crops in 1910 were as follows: Corn, acreage, 3,960,000 acres; yield per acre, 36.5 bushels; production, 144,540 bushels; total farm value, \$66,488,000. Winter wheat, acreage, 1,944,000 acres; yield per acre, 16.2 bushels; production, 31,493,000 bushels; total farm value, \$28,344,000. Oats, acreage, 1,765,000 acres; yield per acre, 37.2 bushels; production, 65,658,000 bushels; total farm value, \$22,080,000. Barley, acreage, 31,000 acres; yield per acre, 28.5 bushels; production, 884,000 bushels; total farm value, \$530,000. Rye, acreage, 56,000 acres; yield per acre, 16.5 bushels; production, 924,000 bushels; total farm value, \$605,000. Potatoes, acreage, 182,000 acres; yield per acre, 82 bushels; production, 14,924,000 bushels; total farm value, \$7,611,000. Hay, acreage, 2,840,000 acres; yield per acre, 1.39 tons; production, 3,948,000 tons; total farm value, \$49,350,000. The area under tobacco was 92,700 and the yield was 75,087,000 pounds. Beet sugar is produced. In 1910 the livestock in the State was estimated at 977,000 horses, 22,000 mules, 947,000 milch cows, and 978,000 other cattle, 3,203,000 sheep, and 2,047,000 swine. The wool clip in 1908 yielded 13,000,000 pounds of wool, valued at \$3,182,400.

Mining and Manufactures.—Ohio has extensive mineral resources. Its coal fields have an area of 12,000 square miles, and provide employment for 47,000 miners. In 1908 the output of coal amounted to 26,270,639 short tons, valued at \$27,897,704. The output of iron ore in the State amounted to 26,585 long tons. With coal is associated petroleum, the output of which amounted to 10,853,797 barrels (of 42 gallons), valued at \$14,178,502. At the same time natural gas was produced in the State to the value of \$8,244,835. From quarries sandstone and limestone were produced to the value of \$4,764,309. Portland cement was manufactured to the amount of 1,521,764 barrels, valued at \$1,305,210. Another product of the State is salt, of which in 1908, 3,427,478 barrels were

extracted, valued at \$64,760. The output of the clay-working industries (bricks, tiles, pottery) amounted to the value of \$26,622,490; the output of lime was valued at \$975,661; other mineral products were grindstones, pulpstones, oilstones and scythestones, besides mineral waters. Value of total mineral output, including 2,861,325 long tons of pig iron (\$47,353,000), was \$134,499,355. The chief manufacturing industries with their capital, according to the last census results, were as follows: Iron and steel, \$130,601,846; foundry and machine shop, \$108,730,473; flour and grist, \$14,931,065; slaughtering, \$6,357,135; boots and shoes, \$10,230,015; liquors, \$41,000,836; carriages and wagons, etc., \$26,798,280; clay products, \$38,408,918; clothing, \$16,776,631; lumber, timber, planing, etc., \$23,151,695; rubber goods, \$11,654,287; printing and publishing, \$23,249,302. The railroads of the State have a length of 9,142 miles, besides 4,540 miles of railroad track. Ohio has also facilities for traffic by water.

Fisheries.—Statistics of the fishing industries in Ohio in 1908 are as follows: Number of persons employed, 2,054; number of vessels, 54; value of vessels, including outfit \$214,879; number of boats, 1,083; value of boats, \$140,900; value of apparatus of capture, \$423,076; value of accessory property and cash capital, \$342,989; value of products, \$839,581.

Government.—The Governor of the State is Judson Harmon; salary, \$10,000. The Lieutenant-Governor is Atlee Pomerene; Secretary of State, Charles H. Graves; Treasurer, David A. Creamer; Auditor, Edward M. Fullington; Attorney-General, Timothy S. Hogan; Adjutant-General, Charles C. Weybrecht; Commissioner of Insurance, Charles C. Lemert, all Democrats, except Fullington. The question of a general revision of the constitution is submitted to the people every 20 years, provision being made for the appointment of a convention to draft alterations. The Legislature consists of a Senate of 34 members and a House of Representatives of 118 members, both Houses being elected for two years. Qualified as electors are (with certain necessary exceptions) all male citizens 21 years of age who have resided in the State one year, in the county 30 days, and in the township 20 days next before the election. Ohio is represented in Congress by two Senators and 21 Representatives.

Finance.—The assessed valuation of Ohio in 1910 was as follows: Realty property, \$1,590,299,746; personal property, \$762,381,078; total assessed valuation, \$2,352,824. The bonded debt was \$1,655,000.

Religion and Education.—The most numerous religious bodies are Catholics, Methodist, Presbyterian, Lutheran, and Baptist. School attendance during full term is compulsory on children from 8 to 14 years of age. In 1909 the public schools numbered 10,567 and had 825,193 enrolled pupils, out of a total population between the age of 6 and 21 of 1,231,954. The number of pupils in the high schools was 73,317. The total number of teachers employed was 27,368. There are seven public normal schools in the State with 47 teachers and 1,579 students, and two private normal schools. For superior instruction the State contains 36 Universities and colleges, of which the following are the more important: Ohio University, Athens, 942 stu-

dents; Miami University, Oxford, 629 students; Oberlin College, 1848 students, Marietta College, 382 students, Cincinnati University, 1,264 students; State University, Columbus, 2,256 students, Wesleyan University, Delaware, 1,210 students, St. Mary's College, Dayton, 380 students.

Charities and Correction.—State institutions comprise a Penitentiary and a Reformatory, an industrial home for boys and one for girls, one for the blind, and one for feeble-minded youth, a soldiers' and sailors' home, and a soldiers' and sailors' orphans' home. Within the State (apart from almshouses and asylums for the insane, etc.) there are 267 benevolent institutions, 62 of which are public, while the rest have been provided by private associations or religious bodies. The institutions comprise 74 hospitals (eight public), seven dispensaries, 105 orphanages (49 public), eight day nurseries, 68 homes (two public). The trustees of townships or the proper officials of corporations relieve the poor, but applicants with legal residence elsewhere (acquired by twelve months continuous residence without poor relief) are to be sent to their county of settlement. Paupers may be required to earn their own support by labor on public property. County infirmaries (almshouses) are under boards of directors who appoint superintendents. Directors and superintendents may not sell or furnish supplies for the poor. Directors report to the State board of charities. Special provision is made respecting pauper children. There is a penalty of \$50 for bringing paupers into the county to make them a public charge.

Legislation.—A regular session of the Legislature was held in 1910. A measure was passed permitting county commissioners to cause marsh lands to be drained and reclaimed for agricultural purposes. The publication, orally or in writing, of statements derogatory to a bank was made a criminal offense. The State offered an amendment to its Constitution dealing with the method of submitting to the voters the question of a constitutional convention, which, by the terms of the Constitution, required that it shall be submitted to the people in 1910. An act was passed "to punish the making or use of false statements to obtain property or credit" which greatly enlarged the scope of the class of offences. City boards of education were permitted to establish elementary schools for tuberculosis children. A State Tax Commission of three members was created. The State, with the view of an increase in the valuations of property for taxation, passed a law limiting the tax rates, which follows the model of the West Virginia act of four years ago.

History, 1910.—The outstanding event on the politics of 1910 was the return of Judson Harmon to the governorship, with a plurality of 100,377. His vote for the entire State was 477,077; that of the Republican candidate, Warren G. Harding, was 376,700. The contest was carried on with great vigor, for Ohio, being the President's State and having a Democratic governor, was doubtful. Notwithstanding the efforts of the progressives whose chief spokesman was James A. Garfield, Secretary of the Interior under Roosevelt, the Regulars carried the convention and nominated Harding as their candidate. The final result was the election of



JUDSON HARMON,
GOVERNOR OF OHIO

the entire Democratic ticket, with the exception of the auditor. The State Legislature of 1909 was composed of 20 Republicans and 14 Democrats in the Senate, and 71 Republicans, 45 Democrats and 1 Independent in the House. The legislature elected in 1910 consists of 15 Republicans and 19 Democrats in the Senate, and 49 Republicans and 70 Democrats in the House. The Democratic majority on a joint ballot is thus 25. In July, Carl Etherington, a special officer, who with the other officers having search warrants, raided a number of illegal saloons in Newark, Ohio, and shot a keeper who assaulted him, was taken from the county jail by a mob and lynched on the corner of the public square. The mayor of Newark, Ohio, and the sheriff of Licking county, who failed to protect special officer Etherington had to resign their offices in order to avoid being removed by action of the Governor. Later the grand jury in Licking County returned 58 indictments against the lynchers of Etherington. The Supreme Court of Ohio handed down a decision holding the sale of near beer or any malt beverage unlawful in "dry" counties. "Dry" candidates for the Legislature ran ahead of their tickets in more than 90 per cent of the cases. In 1910 a number of towns went "dry."

Oil. The oil product of the United States, which in previous years had been rapidly increasing, made the phenomenal gain of more than 30 per cent in 1907, reaching a total of 166,095,335 barrels. This was due to the sudden development of the Illinois field, together with great increases in the oil supply from Oklahoma and California. During the years of both 1908 and 1909 this production was increased, although not by so large a percentage. In 1908 the quantity rose to 178,527,355 barrels, and in 1909 to 182,134,274 barrels. However, there was a decline in value from \$129,079,184 in 1908 to \$128,248,783 in 1909. The average price per barrel was \$0.723 in 1908 and \$0.704 in 1909, this being altogether consistent with the increase in stocks. Only three States contributed largely to increase in quantity, these being California, which gained 21.35 per cent, Oklahoma, which gained 45 per cent, and West Virginia, which gained 12.83 per cent. The greatest decline during the same period was noted in Louisiana, where the production dropped 47.15 per cent. California's product in 1909 was about 6,500,000 barrels more than any other State ever before produced in a single year, while West Virginia's increase brought it from sixth to fourth in the list of oil-producing States, causing it to change places with Texas. All the other States retained their rating of the previous year. During 1910 the growth of mineral oil production was even greater, the bringing in of the famous Lakeview gusher and other large wells temporarily overtaxing all storage facilities throughout the country. It appears certain that there need now be no further doubt that the oil supply of the United States will be ample and steady. The withdrawal of oil lands from entry under the Government's new policy of conservation has not been the severe blow to the industry that was anticipated.

The use of oil as a fuel on the railroads was greatly increased during both 1909 and 1910. During the former year the amount of oil used for this purpose increased by 18 per cent. over the consumption of the previous year,

reaching 19,939,394 barrels, which meant a consumption of 3.93 barrels of oil for every mile operated. At the same time the introduction of oil as a fuel in the navy fully met with expectations. Two battleships, the *North Dakota* and the *Delaware*, were equipped with oil burning plants, while four battleships now in the course of construction will burn oil as an auxiliary to coal. Fifteen destroyers also will be equipped for burning fuel oil. In a number of European countries similar experiments have been made, and in all cases they have been attended with great success. In the case of the battleship the oil has so far been intended to be used only in assisting in maintaining power on long full-power runs after the coal fires have become dirty, or when the trimming of coal in the fire rooms has become difficult. During 1910 two new freight power ships equipped with internal combustion engines were built by the Hamburg-American line. These vessels, which were of 8,000 tons each and capable of a speed of twelve and a half knots an hour, are the largest to which such a form of propulsion has ever been applied. The fuel used will be oil and not gasoline. This can be carried in the double bottoms of the ships, thus doing away with coal bunkers and boilers, while other added advantages will be a smaller force in the engineering department, stokers and oilers being entirely done away with since the bearings will be oiled automatically, the oil being filtered and used over again. These ships will be ready for use by 1912, and will undoubtedly be followed by passenger ships propelled by internal combustion engines. Experts are generally of the opinion that when the latter become a reality the result will be a revolution of the present conditions of engine rooms in popular steamships. The advent of oil as a fuel for ships will mean smaller furnaces and boilers and this fact, added to the decreased storage space required for fuel, will affect either the size or the carrying capacity of the vessels. The shape of the ships, too, may be somewhat modified as a result, while there will be an important gain in that ships will be able to take on oil fuel much more quickly than they have ever been able to take on coal. The latter fact will be of particular value to battleships in time of war when rapidity in replenishing the bunkers is often of vital importance.

Another evidence of the spread of oil for fuel purposes was brought forward in 1910 when it was announced that all the transcontinental railroads reaching Puget Sound would soon substitute oil for coal as a fuel on all the locomotives crossing the Cascade and Rocky Mountains. The Chicago, Milwaukee & Puget Sound Railway was the pioneer in this field by proving that oil brought from California is more economical than coal mined alongside the company's tracks through Washington and Montana. The Milwaukee road is now burning oil on all of its locomotives running between Tacoma and Deer Lodge, Mont. Oil will also be used on its new limited steel passenger service to be inaugurated between Chicago and Tacoma during the spring of 1911. The Northern Pacific Railroad is likewise building a great oil storage tank at Tacoma and gradually equipping its mountain locomotives with oil burners, while the Great Northern Road is preparing to do the same.

During the year 1910 the Standard Oil Company, the huge corporation which controls the oil industry in the United States, and the Shell Transport and Trading Company, the largest oil concern in England, broke off their mutual agreement, and it was generally feared that a rate-cutting war, seriously involving many industries, would ensue. A sharp decline in shares did result, but matters adjusted themselves before the close of the year, and it now appears that the oil situation will remain tranquil. Examination of the real causes underlying the cutting of prices showed that the move was precipitated by the enormous quantity of crude oil, about 100,000,000 barrels, lying in storage in this country. About the middle of Dec. 1910 shareholders of the Standard Oil Company received their final quarterly dividend of \$10,000,000. From 1902 to 1910 inclusive the Standard Oil Company has had net profits aggregating \$673,202,964.

One of the latest developments in the oil industry which the year 1910 produced was the preparation to extract oil from the large coke oven plants in Pennsylvania. Already by means of retort ovens several substances such as coal, tar, ammonia, etc., are obtained from the waste of these ovens, and to these by-products is to be added a light and highly explosive oil.

Oildag. The name of a lubricant whose basal constituent is graphite, is made by a combination of graphite and oil. The graphite is treated with tannin and various plant extracts which reduce it to such a fine state of subdivision that it passes readily through a fine filter paper and remains permanently suspended in oil. The name is formed by the word, "oil," and the initial letters of the phrase "deflocculated Acheson-Graphite." The treatment by which the graphite is reduced to particles so fine that they remain suspended in the oil is called "deflocculation." Various tests of a severe and exhaustive nature have proved that Oildag is a very superior lubricant. Its peculiar and most valuable quality is its power to prolong the efficacy of the natural petroleum lubricating oils. Patents on the manufacture of Oildag have been taken out in practically the whole of the industrial world and the word itself has also been trade marked in the twenty-three countries where patents have been obtained. In 1908 the Acheson Oildag Company was organized and incorporated under the laws of the State of New York, for the manufacture of Oildag and Aquadag.

Oil Engine. An engine in which a mixture of oil, vapor, and air furnishes the motive power. Its principle is similar to that of gas and gasoline engines. The vapor employed is obtained from petroleum, a grade that has a "flash" or ignition point above 73° F. being generally used. The oil is vaporized by the heat of a lamp or the combustion of the engine itself, and this process takes place in a chamber known as the vaporizer (or carburetter when light oils are used), which is either a separate small vessel heated externally by a lamp, or what is practically a prolongation of the cylinder itself. In the latter case the vaporizer is heated externally in order to start the engine, but after that the heat from the compression and combustion of the charge is sufficient to keep the vaporizer at proper temperature. The valve

through which the oil vapor enters the cylinder is usually operated mechanically. The proper amount of air to effect combustion is admitted through a second valve which works automatically during the suction stroke, although in some oil engines one valve serves for both. The products of combustion are removed, after their energy has been utilized, through a third valve opening on the exhaust stroke. There are two well-known types of oil engines, the four-stroke cycle and the two-stroke cycle, both in common use. In the former the working impulse is given at every other revolution of the fly-wheel. The charge of oil vapor and air is admitted during the suction stroke of the piston, and it is compressed in a chamber at the end of the cylinder by the return or compression stroke of the piston. When thus compressed the charge is admitted through a timing valve to the ignition chamber where it is ignited, the resulting expansion driving the piston forward on the working stroke. On the return or exhaust stroke, the products of combustion are removed through the exhaust valve and the piston begins another suction stroke. In the two-stroke cycle engine the impulse is given at each revolution. The air is compressed in the forward end of the cylinder, and then passed around to the back mixed with the oil vapor and ignited.

Oklahoma, formerly Oklahoma and the Indian Territory, proclaimed a State 16 Nov. 1907, following the enabling act of 16 June 1906. Many advanced theories of government were incorporated into its constitution, including the initiative and referendum, requiring only 8 per cent of the voting population to sign a petition to have a measure voted on by the people. To propose constitutional amendments requires 15 per cent. According to the constitution the railroads and other public service corporations are controlled by a commission of three men elected for six years. Appeal may be taken from their decisions to the Supreme Court. The area of the State is 70,057 miles, and in 1910 its population was 1,657,155, an increase of 866,764, or 109.7 per cent, over the population of 1900.

Agriculture and Live Stock.—The largest crop in Oklahoma in 1909 was corn, with 122,250,000 bushels, but the acreage planted to corn has decreased each year by close to 1,000,000 acres. The oat crop increased to 15,950,000 bushels and the wheat crop was 15,680,000 bushels. The cotton crop in 1910 was 295,355,000 pounds; 810,000 tons of hay were grown on 900,000 acres, and worth \$5,913,000. The corn crop was valued at \$55,632,000; wheat, \$15,837,000; oats, 7,377,000; barley, \$448,000; rye, \$50,000. The milk cows in the State in 1910 were 355,000; range cattle, 1,637,000; hogs, 1,302,000; sheep, 108,000; horses, 804,000; mules, 191,000.

Mining and Manufacturing.—Oklahoma has petroleum over 2,000 square miles, and produced, in 1908, 43,798,765 barrels, valued at \$17,694,843. Natural gas extends over 1,000 square miles. Coal was mined, in 1909, to the extent of 2,632,246 tons. Lead and zinc are extensively mined and the total estimate of the mineral production in 1908 was \$26,586,751. The coal production has shown a falling off, 1908 producing 2,948,116 short tons and 1907, 3,642,658. Many of the mines are gaseous and in the fiscal year ending 31 Oct. 1908, there were 164

explosions, of which 44 resulted disastrously. There are 15 street railways in the State with an aggregate mileage of 215 miles. They are capitalized at \$5,604,000.

Education.—There were 470,529 children of school age in Oklahoma in 1908, of whom 297,075 were enrolled, the average daily attendance was 175,673, and the average number of school days in a year, 120. Male teachers numbered 1,237, and female, 7,499, a total of 8,736. The teachers' salaries amounted to \$2,700,000, and the whole expense of school administration was \$3,300,000. There is one law school, two medical schools, 40 high and private schools, three normal schools, and 6 technical schools and colleges.

Charities and Corrections.—The State penitentiary at McAlester was practically completed in 1910, and 1,235 convicts were imprisoned there. The reformatory was established at Granite, and will cost, when completed, \$750,000. The penitentiary cost \$1,000,000. Schools for the deaf, blind, and juvenile delinquents have also been established. Three large insane asylums were occupied in 1910, one at Supply, accommodating 500, the Eastern Hospital for the Insane and the Normal Insane Asylum. Orphanages supported by the Federal Government are filled with Choctaw and Creek Indian children, and the Whitaker Home for Orphans was overcrowded with 140 children.

Finance.—In Feb. 1908, compulsory insurance of deposits in the State banks of Oklahoma was carried into effect. In Sept. 1909, occurred the failure of the Columbia Bank and Trust Company which had the largest deposits of any bank in the State. A year before failure its deposits had increased from \$255,000 to \$1,300,000. With only \$400,000 in the guarantee fund the State began the payments of liabilities amounting to \$2,000,000. Emergency assessments of $\frac{3}{4}$ of 1 per cent were made, and three months after the failure all liabilities were paid. The insurance of deposits was not blamed for this failure, but was held partly responsible for several smaller failures.

Legislative.—Oklahoma's local history during the first four years of its existence as a State have been turbulent, due in part to the unusual necessity of amalgamating two separate territories and preparing for the care of an increase of more than double the population. The most sensational developments were charges of fraud, including indictments against Gov. Charles N. Haskell, on account of the sale of town lots in the Muskegee Township, in 1902. It was charged that Governor Haskell and others, taking advantage of the provision that prior rights would permit purchase at half the auction price, secured dummy entries upon these lots and carried on a wholesale traffic in deeds, hastening to sell to innocent third persons, who would be protected. The case against Governor Haskell did not come to trial until Sept. 1910, and there was no immediate prospect of the matter being closed at the beginning of 1911.

Great excitement prevailed for the last six months of 1910, beginning with the election of 11 June, when it was decided to change the capital from Guthrie to Oklahoma City. On 15 November the Supreme Court decided that the ballot used in the election was illegal and, therefore, Guthrie remained the capital. This

condition remained until the close of the year, when the State militia was called out to assist in quelling the Guthrie mobs when the records were moved.

When the election was held, in June 1910, W. B. Anthony, Governor Haskell's secretary, seized the State seal and in an automobile carried it to Oklahoma City before he could be stopped. Bitter feeling existed in Guthrie and the capital was only completely removed after many threats of violence.

Negro disenfranchisement was openly attempted in Oklahoma at the November elections on the question of illiteracy. This was done to a certain extent but the decision of Attorney-General West that no precincts could be thrown out unless gross fraud was shown on the face of the returns, prevented a wholesale disenfranchisement.

Old Age Pensions. See PENSIONS, OLD AGE.

Oliver, Frank, Canadian Government member: b. Peel County, Ontario, in 1852, and in 1873 went to Manitoba, later removing to Edmonton, where he became a member of the Northwest Council in 1883. He was elected a member of the Legislative Assembly, which succeeded the council and had wider powers, in 1883, and served in that body until 1896. In 1896 he was elected to the Dominion House of Commons as a liberal, and reelected in 1900. In 1905 he became a member of the government of Sir Wilfred Laurier, and has served as minister of the interior since that time. Mr. Oliver's service in that office has been especially marked by the land measure originating with him, and by the policy of the department in dealing with the settlement of the west. The Oliver land bill made important changes in the administration of the land laws, supplementing the earlier efforts of Mr. Clifford Sifton in determining the selection of lands granted to railways, and favoring the settlers. Under the Oliver bill some 28,000,000 acres of land in alternate sections, with lands granted to the Canadian Pacific, were thrown open to entry in 1908. Important changes in the immigration regulations were made at about the same time, by which the flow of undesirable immigrants was checked and the quality improved. Mr. Oliver being a western man, he has been enabled by personal knowledge of that part of the Dominion from a comparatively early day to deal with many questions that from time to time threatened to embarrass development.

Olives. Ravages of the olive fly, despite the vigorous efforts to exterminate it, resulted in a great shortage in the world's olive crop for the year 1910. Expert estimates placed the yield of the olive crop at only about 45 per cent of normal. The output of the Mediterranean countries was remarkably poor. Only a fair crop was obtained in France, while an extremely scarce production was reported from Tunis and Algiers. In Spain but one-fourth to one-third of average yield was secured, and the crop in Greece yielded still less. Syria also had a poor crop in 1910. This general shortage will have a decided commercial bearing through 1911. Two food products of considerable importance are made from olives, namely, olive oil or salad oil, and pickled olives.

A third product which, however, is little known in the United States, is the dried olive, much eaten in Greece and neighboring countries. All olive oil and pickled olives were formerly imported, largely coming from southern Europe. In recent years, however, California has developed the olive-growing industry, and it has now assumed considerable importance in that State. The size of the varieties grown there varies greatly, but a fair average estimates from 150 to 250 to the pound. Both the pulp and pit, which constitutes about 20 per cent of the whole fruit, contains oil. The ripe fruit is used for oil making and for pickling, and for both of these purposes the olives must be selected with great care.

A recent report from the California Station of the United States Department of Agriculture calls attention anew to the olive industry. The olive seems specially adapted to certain parts of California. For this reason the only station which has done any considerable amount of work with the olive is that of California. The olive tree, says the report, is a slow-growing evergreen of great longevity and productiveness. In some of the older countries about the Mediterranean trees hundreds of years old and sometimes 20 feet or more in circumference have been reported. When grown naturally the tree attains a height of 40 feet or more and has a somewhat rounded form. The olive is a comparatively recent fruit in the United States, for, while it has been grown in California since the time of the early mission fathers, it is only within the last twenty years that it has become of commercial importance. The recent investigations of the station show that the industry, as a whole, is still in a somewhat unsatisfactory condition, owing largely to confusion in regard to the selection of suitable soils and varieties, and a knowledge of right methods of culture and manufacture. Competition with cotton-seed oil and other oils sold as olive oil also tends to harm the industry. On the whole, however, there seems to be a good and growing demand all over the United States for olive products. The California Station believes that the profits in the olive industry lie principally in the production of pickles, the larger fruit being used for this purpose and the small-sized made into oil.

Oman. A kingdom in Arabia of about 81,000 square miles in extent. The country extends 1,500 miles along the coast of the Persian Gulf and Arabian Sea. The population is estimated at 400,000 to 500,000. The chief town is Maskat, with about 25,000 inhabitants. The sovereign of the realm is Sultan Seyyid Feysil bin Turki, who succeeded to the throne of his father in the year 1888, receiving the recognition of Great Britain. British intervention in the affairs of government is to some extent tolerated. The Sultan's revenue amounts to about \$125,000. His influence is small, and there is little security for the inhabitants under his impotent rule. In some localities the work of agriculture can be carried on. The chief products and exports are dates, fruit, fish, limes, pearls, and mother-of-pearl; the imports into Oman are mostly rice, coffee, sugar, silk and silks, twist and yarn, wheat and other grain, and implements of strife and ammunition. The value of the imports from Great Britain for 1909 was about \$8,800, and of the

exports to Great Britain about \$150,000. The trade at the port of the capital was valued at about \$4,155,000 for 1909-10. British and Indians control the trade. About 660 vessels entered and cleared at the port of Mascat in 1908-09, over half of which represented British trade. There is communication with the outside world.

Ontario. The leading Province in the Dominion of Canada, lying among the Great Lakes, the extreme southern portion of the Dominion.

Area and Population.—The land area of the Province is 220,500 square miles, the water area, 40,350, total, about 260,850 square miles. The population in 1901 was 2,182,950. Toronto is the capital, and the second largest city in Canada; population, 375,000. Ottawa, the Dominion capital, is in Ontario, population, 83,350. Other towns are Hamilton, 70,200, London, 49,500, Kingston, 19,200, St. Catharines, 12,300, Brantford, 20,700, Guelph, 14,800, Windsor, 16,150, St. Thomas, 14,600, and Stratford, 14,800.

Government and Finance.—The Lieutenant-Governor of Ontario is assisted in the government by an Executive Council of 11 members, eight of them being ministers, and by a Legislative Assembly consisting of 106 members from 102 districts. The Legislature meets at Toronto, annually. The government receipts for 1908 amounted to \$8,597,550, and the expenditure to \$8,551,700. The revenue accrues principally from customs, excise, lands, public works, and the postoffice.

Religion, Education, and Justice.—In 1901 there were in the Province 390,300 Roman Catholics, 367,940 Episcopalians, 477,400 Presbyterians, 666,400 Methodists, and 116,300 Baptists, besides Mennonites, etc. Toronto is sometimes called the "City of Churches." Educational facilities are exceedingly adequate in Ontario. The total number of schools throughout the Province in 1901 was about 6,400, with 11,000 teachers, and 496,750 pupils. There are universities and colleges. The education-grant of the government amounted to \$8,764,350 in 1901. Justice is administered in a Superior Court, and in county courts; there are magistrates and justices of the peace, appointed.

Production and Industry.—Pasturage was promoted on 3,180,800 acres of land in 1909, orchards covered 336,400 acres; and 9,103,800 acres were devoted to crops, the total amount of land cleared being 14,257,150 acres, valued at about \$3,318,949,500. The chief products of the Province are fall and spring wheat, barley, oats, rye, peas, corn, buckwheat, beans, potatoes, turnips, and hay, besides fruits (apples mostly), and some tobacco. There is valuable timber in the woods. Mines are quite prolific in some parts. Cobalt has become famous in the stock markets, gold being found there in considerable quantities as well as other minerals, "cobalt" principally. The live-stock industry in the Province is profitable. In 1909 there were 728,300 horses, 2,688,600 cattle, 1,130,650 sheep, and 1,551,200 swine. Cheese factories are numerous, the output in 1909 weighing 125,611,350 pounds, and being valued at \$14,193,900. The butter made by 109 creameries weighed 9,015,200 pounds and was worth about \$2,175,950. The manufacturing concerns maintained about 8,000 establishments in 1905; employed 189,370 persons; paid \$82,415,500 in

OPEN AIR SCHOOLS — OREGON

wages and salaries; and produced goods to the value of about \$367,850,000

Commerce and Communications—Imports into Ontario comprise a great many articles of consumption and general utility. The importation of tobacco is heavy. Great Britain provides a host of articles, and United States manufactures, etc., find a wide market in the Province. The exports from Ontario consist of many of the products above mentioned, and the trade is largely with the above named countries. Toronto, on Lake Ontario, is the principal port, and has to do with a prosperous Great Lakes traffic. There are railway connections everywhere throughout the Province. The Canadian Pacific and the Grand Trunk Systems are the main railways. There are post-offices everywhere, and rural-delivery routes. Telegraph and telephone lines follow the closely threaded railways, and extend elsewhere, even to remote localities. Ontario has all the advantages of civilization.

Open Air Schools. See TUBERCULOSIS

Opera. See MUSIC.

Opium. See DRUG HABITS.

Orange Free State. See SOUTH AFRICA, UNION OF

Ore Concentration. See METALLURGY

Oregon. The middle of the three Pacific Coast States, containing 96,030 square miles. The population in 1910 was 672,765, an increase of 259,229, or 62.7 per cent, since 1900. This changed its rank from 36th to 35th position in population. Capital, Salem.

Agriculture.—Wheat remains the most important agricultural product of Oregon. The State produced, in 1909, 16,377,000 bushels of wheat, 10,886,000 bushels of oats, and 522,000 bushels of corn. The hay crop was 865,000 tons, grown on 422,000 acres, and sold for \$10,120,000. The cultivation of dry land cereals was increased, partly as the result of experiments at the government experiment station of Moro. A pure wheat of drought-resisting qualities was developed and means were provided for supplying farmers with pure seed. The experiment work at Klamath and Umatilla also tended toward the standardization of crops on irrigated lands. Homestead entries were made on 400,169 acres in 1909, chiefly for agricultural purposes. Lands devoted to the production of all agricultural products greatly increased from the year 1909 to 1910. Diversity and rotation in crops was also practiced to a greater extent than formerly. Of the livestock in the State in 1910, there were 308,000 horses, 698,000 range cattle, 174,000 milk cows, 2,581,000 sheep, 267,000 swine. The scoured wool for 1909 brought \$4,874,750.

Lumber and Fisheries.—The lumber cut has grown steadily for many years, until lumbering and milling have taken first rank among the State's industries. In 1909 there were 1,468,155 thousand feet cut, which sold for \$18,010,588. This was chiefly fir (Oregon pine), spruce, and cedar. The salmon fishing on the Oregon side of the Columbia produced, in 1908, 18,464,000 pounds and on the coast streams 6,423,000 pounds were caught. Salmon fry to the number of 30,586,000 were liberated during the year. On the Columbia River alone 4,772 men were engaged in fishing.

Mining and Manufacturing.—Manufacturing in Oregon is chiefly of home-grown products. The capital involved in 1905 was \$44,023,548, paying \$11,413,512 in wages to 18,523 men, and bringing \$55,525,123 in products. Finished wood products on a capitalization of \$11,038,323 had an annual output of \$12,843,908. On 30 June 1909, there were 2,159.55 miles of railroad in State, and street railroads aggregating 390 miles, capitalized at \$22,310,000.

The gold and silver output for 1909 was worth \$712,900, and the value of the entire mineral output for 1908 was \$2,743,434. An increase in the production of gold was caused by the dredging operations in the rivers in Southern Oregon. There were also outputs above the average in most of the gold camps. Coal is only sparsely mined in Oregon, but 77,017 tons were mined in 1909. Building stone is plentiful, but little was cut for export.

Government.—Oswald West, Democrat, was elected Governor of Oregon, at the November elections, 1910. His length of term is four years, and he receives \$5,000 a year. His term expires 11 Jan 1915. The State senators are elected for two years and the representatives for one year. Each receives \$3 a day while the legislature is in session. The sessions are held biennially for 40 days.

The most important political features in Oregon are its innovations in government. It has the initiative and referendum, the direct primary, a stringent corrupt practices act, and the recall. It also elects its senators by a popular vote under a provision peculiar to Oregon. When presenting themselves as candidates, it is optional with prospective legislators to sign one of three provisions, indicating whether they are willing to abide by the will of the people expressed at the popular election as to United States Senator. Practically this has worked out by causing most of the candidates to sign Statement No 1, which provides that the candidate agrees absolutely to follow the dictation of the popular vote, making the people's choice certain, but avoiding the constitutional difficulty. This provision had the effect, in 1908, of compelling a Republican Legislature to send to the Senate Governor George E. Chamberlain, a Democrat.

Finance.—Oregon has 79 State banks with 14,531 depositors, aggregating \$9,417,941.81 in deposits. There are 70 national banks, with 5,940 depositors and \$1,722,168.62 on deposit. The realty holdings of Portland amount to \$181,825,410, and the personal property \$49,336,190. The combined State debts in 1902 was \$11,302,400. Of this the State owed \$236,267, and the counties and municipalities, \$11,066,133.

Education and Religion.—There were 171,742 children of school age in Oregon in 1910. Of these 118,412 were enrolled in the public schools with an average attendance of 103,553. The average number of school days was 138 annually. A total of 4,234 teachers received \$1,719,044 in salaries. All the expenses of the schools in 1909 was \$2,786,722. There were 110 private and high schools, four public normal schools, and nine technical schools and universities. The State Agricultural College at Corvallis had 984 pupils and 42 teachers. The University of Oregon had 93 professors and instructors and 714 students. The enrollment in the Catholic schools in 1910 was 5,425. The

OREGON PLAN—OVERLOCK

Catholic church is strongest numerically, the Methodist is next, and the Baptist third.

Charities and Corrections.—Aside from the poorhouses there are 22 benevolent organizations in the State. These include a home for the aged, schools for the deaf and blind, six hospitals, one dispensary, five orphanages, and one home finding society.

Legislation.—On account of the use to which the initiative and referendum are put the deciding point on all matters of legislation is at the annual elections in November. In 1910, at this election, woman suffrage was defeated for the fifth time, with the most decisive vote that had been registered against it. On the Oregon ballot were 32 propositions, submitted to the people, either for ratification or by initiative, among them the liquor question which was presented in all its forms, but was decided for local option. An employer's liability law was also passed, doing away with the fellow employee contributory negligence clause. In spite of the great number of questions to be voted upon, 75 to 90 per cent of the voters used their privilege on every question submitted. Since the introduction of the initiative in Oregon many attempts have been made to secure legislation with a "joker," but such attempts have invariably been defeated. An innovation of a radical nature, providing a preferential system of voting was defeated at the November election. This plan was to give each voter an opportunity to name his candidates for each office in order of preference, the election officers eliminating those with the lowest number of votes until but two remained. An initiative measure for the publishing of a State paper, giving exact detail of all expenditures, and the provision for the appointment of business managers for various governmental posts was also defeated.

Oregon Plan. See INITIATIVE AND REFERENDUM

Organic Chemistry. See CHEMISTRY, ORGANIC.

Oriental Society, American. During the year 1910 the American Oriental Society published four numbers of its journal, being parts of volumes 31 and 32 of the society's publications. These numbers contain 17 scholarly articles on various branches of Oriental learning, and a record of the proceedings of the society during the year. The annual meeting in New York was followed by the session of the society at Baltimore in April. The next session of the society takes place at Cambridge, Mass., in Easter Week, 1911.

Ornithology. See BIRD PROTECTION.

Osborn, Chase Salmon, American politician: b. Huntington County, Ind., 22 Jan. 1860. He was educated in the public schools of Lafayette, Ind., and then took a three-years' course in the Purdue University. He early took up newspaper work, first at Lafayette, Ind., thence going to Chicago, and from there to Milwaukee and Florence, Wis., and Saginaw and Sault Ste Marie, Michigan. In Michigan his political career began. In 1895 he was appointed State Game and Fish Warden, holding the office for two years, and was then appointed State Railroad Commissioner. In 1908 he was delegate to the Republican National Convention; and in 1910 was elected Governor of

Michigan by a plurality of 43,000, one of the few Republican governors elected that year.

Osborne, Edward William, second P. E. bishop of Springfield, and 219th in succession in the American episcopate b. Calcutta, India, 5 Jan. 1845. He received his education in Gloucester, Eng., and was ordained priest in the Church of England in 1869, serving as a parish clergyman from 1869 till 1875, when he became a mission priest of St John the Evangelist, and at Oxford, Eng., until 1878. He came to America in the latter year and was priest in Boston, Mass., 1878-89, when he was appointed superior of the mission at Cape Town, South Africa, serving until 1907. He was provincial superior in America 1898-1904, and was elected coadjutor to the Rt. Rev. George Franklin Seymour, bishop of the diocese of Springfield. He was ordained 23 Oct. 1904 by Bishops Seymour, Potter, and Grafton, and on the death of Bishop Seymour, 8 Dec. 1906, he succeeded to the bishopric. Bishop Osborne is the author of 'The Children's Savior' (1879); 'The Children's Faith' (1882); and 'The Savior King' (1901).

Osteopathy. During the past few years osteopathy has spread considerably, and there is, at the present time, not a State in the Union which does not possess a number of practitioners of this branch of medical science. As the result of constant dispute, litigation, and "lobbying," osteopathic physicians are allowed to practice in several States, at the present time—though they are debarred from other States. It was not many years ago that osteopathy was considered a "cult" hardly worthy of serious consideration by the medical profession; to-day, it is acknowledged on all hands to be of great service, and in many cases of inestimable value. The principles of osteopathy; the fundamental idea of the system, is that cure is to be effected by means of deep and persistent massage of a peculiar character—pressing the outer muscles down, onto the bone (hence the name, osteo-pathy). This idea is, however, greatly extended in practice. Physicians of this school see in misplaced and displaced vertebræ the causes of the majority of the ills from which mankind suffers; and their object, in many cases, is to adjust and, as it were, reset these displaced joints—which, by pressing unduly upon certain nerve-centers, produce gastric and nervous affections of all kinds. Pressure over certain centers of contracted muscles, etc., is also considered a cause of much trouble. In fact, osteopathy seeks to prove that the majority of human suffering is due to a *mechanical* cause; and, in many cases, with undoubted success. Osteopathy rarely does harm, and frequently does a great amount of good. For this reason, it will doubtless become more and more widely practiced.

Outdoor Schools. See TUBERCULOSIS

Overlock, Melville G., American physician and philanthropist: b. Appleton, Maine, 24 Aug. 1864. He attended the public schools and the State Normal School at Castine, Maine, at the same time teaching mathematics to defray his expenses. He studied medicine under Dr. J. B. Rich, of Worcester, Mass., 1890-02; at the medical department of Dartmouth University

OXO-HYDROGEN BLOW PIPE—OYSTERS

1892-93 and was graduated from the medical college at Baltimore, Md., M.D., 1896. He established himself in practice in Worcester, was one of the originators of the Independent Pharmaceutical Company of that city; was a member of the school board, and in 1902 was elected a trustee of the Worcester City Hospital and later was appointed State Health Inspector. In 1905 Doctor Overlock was an unsuccessful candidate for mayor of the city. He originated the movement in Massachusetts, which had for its aim the instruction of factory employees in proper sanitary living and the prevention of tuberculosis and he delivered noon-day lectures in many factories. He was greatly aided by the employers themselves, who entered into his scheme for caring for employees stricken with the "great white plague" and the Worcester Merchants' Association, comprising more than 200 concerns and representing over 2,000 employees, announced its purpose of adopting Doctor Overlock's scheme as a body. Instead of being dependent on the State for their care, patients are enabled through this new measure of generosity on the part of the factory owners, to obtain the necessary treatment. The movement has spread rapidly and inquiries from England, France, Russia, and other European countries have been received. The "Overlock Idea" as it is called, being accepted as one of the most simple and efficient philanthropic movements of modern times.

Oxo-Hydrogen Blow Pipe. See METALLURGY.

Oxygen. An important series of experiments has lately been conducted by Dr. Leonard Hill, of London, on the effects of oxygen upon the general bodily condition of athletes, and especially upon the ratio of carbon dioxide accumulated in the body after inhaling pure oxygen. A number of athletes were given pure oxygen gas, immediately after which they were requested to perform certain exercises, which they had previously attempted. It was found that, at the first trial, two Olympia runners were able to break their records for the half and quarter mile in unpaced trials. It was also found that, after breathing oxygen for five minutes, the breath could be held for six or seven minutes, and in one case it was even held for nine minutes, six seconds.

Several athletes who were tried, found that they could pull up a 60-pound weight 19 inches high 17 times in 23 seconds without taking a breath, and, after deep breathing (air) for two minutes, 30 times in 50 seconds, and after deep breathing (oxygen) for two minutes, 70 times in 85 seconds, without taking a breath in either case. It was also found that it was possible to run up and down the laboratory (30 yards long) six times in 47 seconds without a breath; and after inhaling oxygen for two minutes, 14 times in 1 minute, 50 seconds.

Experiments are also being conducted by Doctor Hill to ascertain the best method of letting workers out of compressed air caissons without accident. The paralyses and deaths which result, he claims, are due to nitrogen gas dissolved in the body fluids and fat while in the compressed air,—and this gas effervesces off and forms bubbles in the blood vessels if the men do not come out slowly enough. Safe methods of decompressing are now being tried; also experiments in drinking water under

different pressures. These will doubtless prove of great value in various ways.

Oysters. In March 1910 the Rhode Island Shellfish Commission, with Prof. F. P. Gorham, of Brown University as expert adviser, undertook an elaborate investigation of the oyster industry, considering all its phases in great detail. The result of this investigation has been the placing of the oyster industry in Rhode Island on a clean, sanitary foundation, so that henceforth the people of that State may feel reasonably sure that all their oysters are as clean and pure as it is possible for them to be. Meanwhile the industry in other States has benefited as a result, so that the oyster business is on a much improved plane throughout the country. Professor Gorham, the expert of the Shellfish Commission, has given it as his opinion that the question of disease being carried by the oyster is one which has received altogether too much attention. The only record of a disease which could be traced to an oyster was, so far as his studies in the subject went, one which had occurred at Middletown, Conn., in October 1894. The chief danger of pollution of oysters lies in the proximity of oyster-beds to sewers. The oyster will take in as food the typhoid germs emitted from the sewers if the opportunity presents itself. To obviate any risk of disease from oysters so polluted the Shellfish Commission during 1910 condemned 23,000 acres of oyster land as a result of its investigation. Part of the commission's work has already been finished, but, the entire analysis will not be completed until late in 1911, when it is expected a detailed report will be issued. The investigation thus far has developed that the pollution of oysters is greatest where the oyster beds are located close to centres of population, although practically the entire coast line of Narragansett Bay contributed to the pollution. It is reported that the owners of the oyster-beds which have been condemned are instituting damages against the towns whose sewer pipes have caused the condemnation of their beds. The commission also devoted its attention to the oyster-opening houses, with the result that to-day conditions are much improved there, while the oystermen themselves have, as a whole, evinced a disposition to cooperative with the Commission in bringing about a general improvement in conditions. Rhode Island is one of the most important States from the point of view of the oyster industry, 20,000 gallons of open oysters being shipped daily out of that State during the season, while during 1909 that industry turned \$110,000 into the State treasury. Massachusetts has joined with Rhode Island in enforcing in the strictest manner the laws for pure oysters, and a vigorous campaign along this line will be conducted in that State throughout 1911.

Oysters should be scrubbed and cleaned by machinery or hose, and all weak ones culled before shipping, and they should not, as has so often been the case, put on sale in dirty shells. A fresh oyster, the instant it is touched, tightens like a clam. Oysters grow only during the summer, and are scarcely large enough to eat before their third year, while many oysters live to be 20 years old.

An effort is now under way toward the creation of what will practically amount to an oyster trust. Powerful banking interests, work-

ing through the Sealshipt Oyster System, are behind this movement. Already this company owns 30,000 acres of under-water oyster grounds along Long Island Sound and Narragansett Bay, as well as 14,000 acres, representing about 95 per cent of the Blue Point beds in Great South Bay, which, since the ruling of the New York State Legislature against misnaming oysters, are the only sources of the Blue Point oyster. These holdings of the company are valued at \$3,000,000. It is reported to be the intention of the company to extend its operations into the Chesapeake oyster fields and to handle the so-called in-the-shell trade in the same way that the bulk oyster distribution has been organized. The concern's grasp of the retail distribution is evidenced by the fact that it already has 25,000 agencies handling the bulk of oysters under the system of distribution under a trademark method. All of these agents sell at a uniform price and are allowed a uniform profit, the company's policy being to attract buyers to its product by a wholesale advertising campaign and exploiting sanitary methods of cultivation and shipment with certified bacteriological analyses.

The oyster trade in England also received an impetus in 1910 with the opening of the Colne oyster fishery, off Brightling Sea, Essex, on 10 September. This opening was made an elaborate occasion and attended with ancient ceremonial, which harked back to the times of King Richard I when the previous charters of the fishery were reconfirmed. After the first dredger had been cast by Alderman Sanders, chairman of the Fisheries Board, a telegram telling of the event was despatched to King

Ozonization. The ozonization of water by means of electricity in order to obtain a pure supply has been advocated by the *Medical Record* in an article which says: "Certainly one of the chief aims of sanitary science is to procure a pure water supply. When this object is achieved, or when a water supply can be obtained which is free from harmful germs, a great victory will have been won. As yet we do not seem to be near realization of this ideal state of affairs. It must be remembered that water is largely responsible for epidemics of typhoid fever and of cholera, to mention the two most serious water-borne diseases, and typhoid fever is by no means extinct in the United States." Sand filtration,

and especially slow-sand filtration has done much to check typhoid fever, but it is still filtration and not sterilization. Recently a method of purifying water has been tried which has not been used on a sufficiently large scale, nor for a long enough period of time to justify very decided assertions as to its merits. This is the ozonization of water by means of electricity as a sterilizing agent. The principle of purifying water by ozone has, of course, long been known and has been used on a small scale for some years. Its adoption for purifying the public water supply of a fair-sized community dates back about seven years. Paderborn, in Germany, in 1902, was the first town of any size to install a system of purifying water by ozonization, and electricity was the agent utilized to manufacture the ozone. The principle of preparing the ozone by electricity is the same everywhere, but the particular method followed in Paderborn and other German towns in which the system is in vogue is described as follows. "Air inclosed in parallel plates is forced by means of a blowing apparatus through a discharge chamber, where it is subjected to currents of electricity at a high voltage. The velocity of the passage of air through this chamber is regulated in such a manner that when the air leaves the chamber it is impregnated with enough ozone to sterilize water. The water which is to undergo the sterilizing treatment by ozone is first passed through a special sand filter to remove all solid matter in suspension. The water is then pumped into towers and as it passes down through the towers the ozone is forced into them from below and brought into close contact with the water destroying the bacteria contained therein. The water thus treated and freed from bacteria passes out from the towers and is fit for consumption." Wiesbaden has had an ozone plant for several years which is tasted to give satisfaction. The results of treating water by ozone have been tested experimentally at Koch's Institute and at the Imperial Health Bureau in Berlin. Water was taken from the Spree and largely infected with cholera germs. It was then passed through the ozone plant and an examination showed that the disease-bearing bacteria had been destroyed. As filtration has been found wanting it will probably be generally supplemented by a process of sterilization

PADDOCK, Robert Louis, missionary P. E. bishop of Eastern Oregon, and 235th in succession in the American episcopate: b. Brooklyn, N. Y., 24 Dec. 1860. His father, the Rt. Rev. John Adams Paddock, was first bishop of Olympia, and his uncle, the Rt. Rev. Benjamin Henry Paddock, was fourth bishop of Massachusetts. He was graduated from Trinity College, A.B. 1894, A.M. 1897, and from the Berkeley Divinity School in 1897. He was ordered deacon in 1897 and was in charge of a mission in Southington, Conn., until his elevation to the priesthood in 1898. He was general secretary of the Church Students' Missionary Society and assistant rector at St. Paul's Church, Cleveland, Ohio, 1897-98; vicar of the pro-cathedral, New York, 1898-1902; and rector

of the Church of the Holy Apostles, New York City 1902-07. He was elected first missionary bishop of the newly-established diocese of Eastern Oregon in 1907, and was consecrated 18 Dec. 1907 by Bishops Tuttle, Gailor, and Edsall. The honorary degree of D.D. was conferred on him by Berkeley Divinity School in 1908, and that of S.T.D. by Hobart College the same year.

Padrone System. See CONTRACT LABOR.

Pain. For many years pain has been considered as having considerable diagnostic value. Only recently, however, much important research has been devoted to this question, and several works of interest published. The most important work of late years on this subject is doubtless that of Dr. Rudolph Schmidt, of

Vienna, 'Pain: Its Causation and Diagnostic Significance in Internal Disorders' (1908) Doctor Schmidt has considered pain from all possible points of view. After discussing the sensation of pain, and its significance, the author discusses the functional modifications of pain, taking into consideration the influence of position, motion, pressure, food, drugs, and chemicals, and organic function. Pain in the various parts of the body is then considered—its significance when occurring in the shoulder, the retrosternal region, the interscapular region, the epigastrium, the abdomen, the lumbar region, the flanks, etc. Following this, the quality and time of occurrence of various pains are considered—colicky and nocturnal pains, etc. Next, the nervous system (headache, neuralgia, etc.); the organs of motion (joint, muscular, and bone pains); the digestive system (gastritis, colic, and pyloric stenosis, gastric ulcer, intestinal ulceration, disease of the appendix, lead colic, malignant new growths of the intestines, gall-bladder colic, distention and inflammation of the capsule); the urinary system and spleen (kidney pains, muscular spasms, etc.); the respiratory and circulatory systems and cutaneous tenderness in visceral disease, are all considered.

By an ingenious system which Doctor Schmidt has worked out, he is enabled to diagnose the seat of almost any trouble from an examination of certain pain-areas on the periphery. The published charts are essential to a study of the details.

Paine National Historical Association. On Decoration Day, 1910, was dedicated the Paine Museum at New Rochelle, N. Y. The building selected was the old house presented to Paine in 1784 in recognition of his valuable services during the Revolutionary War. More than two hundred persons were present at the services, which were conducted by the Thomas Paine National Historical Association. The speakers were Leonard Abbott, president of the Thomas Paine National Historical Association, Prof Thaddeus Burr Wakeman, Dr. Julius Severance, and W. M. Vander Weyde, secretary of the Paine Association. The Paine monument, from the base of which the speeches were made, was handsomely decorated with wreaths, flags, and large bunches of peonies. The wreaths were of special historical interest, one of them being composed of leaves of laurel gathered from Valley Forge, from Rocky Hill, and from Bordentown, N. J.—three places memorable in the life of Thomas Paine—while the other was made from leaves from the tomb of Washington at Mount Vernon. Among the most interesting things which the new museum contains is a life-sized figure of Paine himself sitting with quill pen in hand. The chair whereon this rests is the identical one which the dead hero used in his New Rochelle home. Numerous other intimate relics of Paine are on view there, the entire collection being one of the most complete, authentic, valuable exhibits of the kind in this country.

Painting. See ART.

Palisades Inter-State Park. In 1909 Mrs. Mary W. Harriman, widow of E. H. Harriman, offered to convey to the State of New York about 10,000 acres of land in Orange and Rock-

land Counties, to be held in perpetuity as a State Park and also to give the sum of \$1,000,000 to be used in furtherance of the same object.

The gift by Mrs. Harriman was made on the condition that a sum of \$1,500,000 in addition to the \$1,000,000 given by her, should be raised by private subscription, making \$2,500,000 in private gifts in cash. It was also conditioned the State of New York should make an appropriation of equal amount (\$2,500,000) and that the State of New Jersey should also make a suitable appropriation for the park, that the proposed erection of a state prison on Bear Mountain site (within the bounds of the proposed park) should be discontinued; and that the Palisades Inter-State Park Commission should have their jurisdiction extended as far north as Newburgh, so as to include the area of the proposed park.

Subscriptions were obtained from J. P. Morgan, John D. Rockefeller, and others to provide the \$1,500,000 needed from private sources, but it was found that under the act, Chapter 363 of the Laws of 1910, before the State could appropriate so large an amount the matter must be submitted to the people of the State for approval before it could become effective.

On 5 Jan. 1910 Governor Hughes in his annual message to the State Legislature recommended that the gift be accepted, and the proposition that the State issue bonds to the amount of \$2,500,000 for the use of the Commissioner of the Palisades Inter-State Park in extending and improving the park under their jurisdiction was submitted to the voters in the fall election of 1910 and ratified by them.

Pan-American Union. When the handsome building of the Pan-American Union was dedicated at Washington, D. C., on 26 April 1910, the world witnessed the beginning of a new peace-promoting force among the powers which seems destined to take second place in this regard only to the Hague (q.v.). The establishment of this institution is the result of the efforts of Mr. Andrew Carnegie, who provided the funds which brought it into being, but so quietly and with such unostentation was it started the general public scarcely realized its true significance. It has, perhaps, been best characterized by Senator Elihu Root, of New York, who styled it, "The Capitol of American Republics within the Capital of the United States." It is an institution devoted to commemorating the pact between the 21 American republics in order to bring about a better understanding among all, and to promote permanent peace and universal prosperity. The director-general is Mr. John Barrett, still a comparatively young man, yet one who is looked to by high government officials to bring the new institution to the highest possible point of operative efficiency. Mr. Barrett has been a newspaper reporter and a persistent "boomer" of the commercial advantages of the Pacific Coast and was particularly prominent in attracting new settlers to the Puget Sound country. He is a man who is probably more familiar with the South American situation than any other individual in the United States, and the fact that he is shaping the course and policy of the new bureau is one of the main things which causes this country to set such great store by it. In order to bring about the much-to-be-desired

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peace Mr. Barrett is working on the theory that a man engaged in work is too busy to have time for fighting. He, and those associated with him in the movement, declare that one of the chief reasons for the failure of this country and the Latin-American Republics to cooperate is because of misunderstandings, and add that the only way to overcome these is through extensive trade and commercial relations between the two. History shows that the conquest of foreign markets and the conquest of foreign affections is generally apt to be simultaneous.

It must be acknowledged that most of the misunderstanding has been on the part of the United States. The "Latin-American Republics" have always been pretty well conversant with the United States and its affairs, but the United States, though it set them the example of declaring independence of royal rule, has been wont to look down upon the sister republics as inferiors and in matters of trade turn its eyes almost exclusively towards Europe and the Orient." The initial impetus which led to the establishment of the Pan-American Union since it was the first real acknowledgement of the relationship of the two sections by the United States, occurred with the treaty of 1820 by which this country acquired Florida, which was ratified at Madrid in October of that year. This intia-tory advance was further strengthened by President James Monroe in his message to Congress of 2 Dec 1823, in which was enunciated his famous proclamation to the Old World that any attempt to interfere with the New World dependencies would be resented by the oldest republic of the group. Although this doctrine was framed with laudable intent and has been the basis of several succeeding actions, it has utterly failed to group the various republics into the operative unit desired. Treatment to bring about the latter state of affairs has been going on for a score of years and the history of these efforts is also the history of the Pan-American Union, or, as it was formerly, called, "The International Bureau of the American Republics." In 1889-90 delegates from 17 Latin-American Republics met in Washington to discuss with delegates of this country political and economical problems of mutual interest. This conference was instigated and presided over by James G. Blaine, then Secretary of State. It clearly established the fact that the American people needed to be educated in regard to the Latin-American republics, and taught many for the first time that the chief resources of the latter were not llamas, pampas-grass, ore, and the Amazon River. Following this conference an attempt was made by American statesmen to interest the capitalists of the United States in Latin-America, and, though it bore no immediate fruit, it may be said to have sown the first seed of commercial interest which Mr. Barrett now seems likely to develop into a powerful and harmonizing force.

The second Pan-American Conference was held in Mexico City in 1901-2, the third at Rio de Janeiro in 1906, and the last at Buenos Aires in compliment to the Argentine Republic which celebrated the centennial of its struggle for independence from Spain. All of these furthered the work begun at the first conference, and

were links in the chain which made the International Bureau of American Republics a reality. See PAN-AMERICAN CONFERENCE

The new bureau is to be supported by annual contributions from the 21 American Republics, the sum paid by each to be in proportion to its population. Although this will cause the United States to pay the highest tax, this country has more to gain through the new institution than has any other, and has the further advantage of having the permanent seat of the association at its capital, as well as having one of its citizens directing it. The affairs of the Bureau will be administered by a governing board, comprising the diplomatic representatives of the Latin-American Republics at Washington, and presided over by the Secretary of State of the United States as chairman ex-officio. The chief administrative official is the director, who is chosen by vote of the governing board, and he is in every sense an international officer.

The International Bureau of American Republics, which in a small way was the forerunner of the present organization, despite the vigorous efforts of James G. Blaine to have it provided with a fit home, was able to get only a small dwelling house for its meetings, which was situated at 2 Jackson Place, Washington, D. C. Here the first director was William E. Curtis, filling that office from 1890 until 1893. He was also executive officer of the first Pan-American Conference, special commissioner of the United States to Latin-America, and chief of the Latin-American Department of the Chicago Exposition. Although under his leadership the bureau never attained to any large degree of efficiency, the work of organization which he performed was important. He was succeeded by Clinton Furbish, who served from 1893 to 1897, and was in turn succeeded by Frederick Emory, who served until 1899 when his place was taken by W. W. Rockhill, who gave way to William C. Fox in 1905. Mr. Barrett succeeded Mr. Fox, being given the office largely through the efforts of Senator Elihu Root who, though appreciating the faithful work of the previous directors, realized that the bureau was not coming anywhere near its possible efficiency. It was after the latter had attended, in the capacity of Secretary of State, the 1906 conference at Rio de Janeiro, that he conceived the idea of making this institution a power for peace and prosperity alike, and began the work of reorganizing it into the International Bureau of American Republics. He called John Barrett to his aid in this and, after outlining the broad general lines of his idea, turned over the actual work to him. How well he has succeeded in this during his three years of work the building which was dedicated in 1910 evidences. Mr. Andrew Carnegie, who was a member of the first Pan-American Conference, donated the \$750,000 which covered the cost of the erection of this edifice, while a Congressional appropriation of \$200,000 paid for the spacious grounds; and the combined contributions of the Latin-American Republics, amounting to about \$50,000, were applied to equipping and furnishing the building.

While the object and purpose of the Pan-American Union is avowedly: "First, to develop commerce and trade, and, second, to

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promote better relations, close acquaintance, and more intimate associations among the American Republics," it is doing much more than this. It is conducting an educational campaign in the furtherance of which it sends a vast amount of free literature in regard to all the American Republics not only to business men who may be directly influenced, but also to universities, clubs, schools, and like institutions. The bureau is at present receiving and answering over 3,000 letters of legitimate inquiry about the Latin-American Republics each month, which represents an increase of about 400 per cent over its business at the time when Mr. Barrett assumed charge. The monthly bulletin of the Bureau, formerly comprising but a few pages, is now issued in the form of a handsome magazine which has a monthly circulation of 10,000 copies. All this has resulted in a great stimulation of interest in the Latin-American Republics, and already commerce between them and this country is receiving an unprecedented impetus. It seems probable that under the present régime this will continue to grow until it assumes the proportions for which the instigators of the bureau hope, and even now it has begun to make for a more peaceful state of affairs among these turbulent republics. The Pan-American Union also furnishes free information to all those interested in the subject. It is able to do this probably better than any other institution, through its possession of the Columbus Memorial Library, which now contains more than 20,000 volumes. This was started at the inauguration of the first Pan-American Bureau and contains exhaustive historical, geographical, statistical, literary, and travel works together with maps of all the various American republics.

Panama. A Republic in Central America, formerly a part of the Colombian Republic; a neck of land between the American continents.

Area and Population.—The area is about 32,000 square miles; total length, 480 miles; average width about 70 miles, minimum, 37 miles. There are about 400,000 people in Panama, principally Spanish, Indian, and Negro mixed races. There are about 3,000 Chinese, 40,000 West Indian Negroes, and a number of United States citizens—working on the Canal. Panama City is the capital, with 40,000 population. Colon, on the Atlantic, has 15,000 inhabitants. Other ports are Bocas del Toro and Puerto Bello, on the Atlantic; and Agua Dulce, Pedregal, Montijo, and Puerto Mudis, on the Pacific coast.

The Canal.—Panama's existence as a Republic is a result of United States protection. In consideration of this and the sum of \$10,000,000 paid at the ratification of the treaty of 1904 (the year succeeding the secession of Panama), together with annual payments of \$250,000 after the year 1913, the United States has been granted a strip of territory from coast to coast for purposes of canal construction. (See PANAMA CANAL). The canal zone is five miles wide, and is entirely under United States control. The total length of the canal will be about 46 miles; breadth, 300 to 500 feet; depth, 40 feet. There will be six locks. The date for opening this inter-ocean waterway has been officially set for 1915. Concessions looking to the fortification of the canal have been made

the United States, and in the two principal ports of the Republic—Panama and Colon—the United States enjoys exercise of full authority as regards sanitation. There must be no duty imposed by the government upon material for canal construction, or upon provisions for the constructors. The canal project is not a new one, attempts having been made in 1881 and in 1889 to marry the oceans. A great deal of effort was expended by a French company in the latter year, but proved abortive through lack of funds.

Government and Finance.—At the head of government stands a President, who is elected for a four-year term and may not succeed himself. There are two Vice-Presidents, and a Cabinet composed of five ministers. A Chamber of Deputies, consisting of 32 members (each member representing about 10,000 of the population) meets 1 September of every other year. Local administration in the seven provinces of the Republic is conducted under seven governors. The receipts of the government for the years 1909 and 1910 were estimated at about \$5,000,000, and the expenditure at about the same amount. In lieu of a debt the Republic has the asset of an investment amounting to about \$7,700,000.

Public Instruction.—There are elementary schools in the country to the number of 255, with a total enrollment of about 16,500; besides free schools in the canal zone with more than 1,700 pupils. The system of education in Panama is unsatisfactory, and is undergoing a change therefore. The government is supporting a number of students abroad, that they may return and build up the work of education.

Products, Industries, and Commerce.—Only about 2,551,700 acres of land in Panama are under occupation, and but a small portion of this is under cultivation. Notwithstanding, the soil is very fruitful. A German agricultural organization has, since 1894, been successfully operating in the province of Coclé; 75,000 cocoa trees are planted, 50,000 coffee plants, and 25,000 caoutchouc trees; all are beginning to yield. Other products of the soil are coconuts, mahogany and rare woods, copaiba, sarsaparilla, and ipecacuanha. Sugar and tobacco are being cultivated. The coffee crop in one province is picked from about 500,000 bushes. The annual production of caoutchouc is about 130 tons. But the greatest product of the country is the banana. About 2,500,000 bunches of bananas, worth \$625,000, are grown each year. Among the industries cattle and other stock raising is important. Live stock in 1905 consisted of 65,000 cattle, 17,000 horses, 1,500 mules, 28,000 swine, and 3,000 goats. The mining industry is only in its infancy, for the country is rich in minerals. Turtle-shell and pearl fisheries are of some significance. Manufactured goods and articles of food constitute the principal imports, which amounted, in 1909, to the value of \$8,756,500, of which the worth of \$4,871,700 (independent of canal supplies) came from United States. The exports from the Republic are chiefly gold, hides, rubber, pearl shells, cabinet woods, bananas, and drug plants; and in 1909 amounted to the value of about \$1,502,000.

Shipping, Railways, and Telegraphs.—Tonnage registered at the port of Colon in 1908 was 1,116,350 tons. Total number of vessels

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entered at the ports of the canal territory in that year, 1,100, of about 1,903,220 tons; American tonnage, 370,375. Several lines of steamers touch at the ports of both the Atlantic and Pacific coasts. According to a stipulation of the treaty of 1904, the canal will be equally "accessible" to the vessels of all nations. The United States Government owns the only railway, which connects the two chief towns of the Republic, is 47 miles long, and cost about \$7,500,000 for construction. Telegraph cables give communication with the United States and Europe, etc.

History, 1910— There has never been anything quite like the present "canal city" or collection of settlements in Panama, established with the resources and under the direction of the Isthmian Canal Commission. In fact, it might be said without any reservation. The nearest parallel is found in towns which have grown up mushroom-like in some parts of the West. The rule of the commission secures to the population of the Canal Zone all the comforts and many of the luxuries of civilization, including schools, department stores, and clubs. In the zone there are some 39 churches, 26 of which are owned by the Canal Commission, and 11 of the others are on land owned by the United States. The other two are the Wesleyan Church at Gutan and the Episcopal Church at Bas Obispo. Every encouragement is lent to church work in the zone, as the Commission considers that thereby stability and good order are encouraged. More than 1,700 children are enrolled in the Canal Zone free schools.

A strong naval base is to be established at Guantánamo, by the advice of the war experts of the War and Navy departments, who reason that any battles of the future in which the United States may engage are likely to be fought in the neighborhood of the Panama Canal. It is necessary therefore to have a large base of supplies within easy reach of the canal. Secretary Meyer, who was the American Ambassador at St. Petersburg at the time of the war with Japan, is strongly convinced of the necessity of doing away with red tape in naval affairs, and being prepared for possible contingencies far in advance. The Guantánamo plan is one of the contemplated moves intended to make the navy a practical war machine.

On 1 Oct. 1910, Vice-President Frederico Boyd assumed charge of the Government of Panama as acting President, in place of Dr. Mendoza, and a little later his place was taken by Dr. Pablo Arosemena, First Vice-President-elect, who at the time of his election was minister of Panama to Chile.

On 28 October, the Government of Panama secured permission from the United States to establish at various places additional schools for Panamanians of both sexes, to be taught by natives, the expenses paid from the Panama national treasury. These schools will include high schools, an industrial school teaching hat manufacture, an agricultural school, and kindergartens.

President Taft visited Panama in November, and was warmly received. A banquet was given in his honor by President Arosemena at the Hotel Central in Panama City, at which President Taft made a speech positively de-

nying certain rumors to the effect that the United States would annex Panama. President Taft made the following statement: "We are here to construct, maintain, operate, and defend the world canal which runs through the heart of your country. . . . We do not wish any further responsibility in respect to your government than is necessary in the carrying out of our purpose to construct and maintain this canal. We have no desire to add to the territory under our jurisdiction, except as the operation of the canal may require it."

There was some discussion in the latter part of 1910 over a project for building a railroad from Panama to David, 300 miles in length, the plan being proposed under the administration of the late President Obaldia. Samuel Lewis, then Minister for Foreign Affairs, went to Washington to discuss this project and to argue that, in order to exclude British capital and control this land approach to the canal, the United States should build the road. Chairman Goethals did not agree with this view, but President Taft went so far as to order the Government's Panama Railroad Engineering Corps to make the surveys for the proposed road, the Panama Government paying the expenses. Lewis's plan was to induce the American Government to finance the road, should Panama be unable to assume the whole burden, as an extension of the Panama Railroad already built by the United States. It was thought that the President's visit to Panama might have been for the consideration of this plan, but nothing was said of it in public.

A movement is on foot for a World's Canal Exposition in 1915, to celebrate the opening of the waterway. New Orleans and San Francisco both desire to have this exposition, but the Congress, after a full hearing granted to the adherents of both cities, gave its official sanction to the claims of the latter city.

Panama Canal. At the close of the year 1910, Col Geo W. Goethals, chief engineer in charge of the Panama Canal, was able to announce that it would be completed on time. The facts which became known with the publishing of his report show the actual progress and make it apparent that there has been greater advance than has been generally believed.

The portion of the canal which is most important in respect to time is the double flight of locks and three lifts at Gatun. There satisfactory headway has been made in excavating, concrete work, constructing the culverts, and the operating valves for the filling and emptying the locks, and in preparing for the mammoth steel gates which will dam the water in the locks. In the lock chambers themselves there have been excavated during the year 4,500,000 yards of dirt, 500,000 yards of it in the wet. In addition, auxiliary work required the excavating of 640,520 yards. The upper and middle lock spaces were entirely excavated and all that remained at the close of the year was 375,000 cubic yards for the lower locks.

The cost of this enormous work had been reduced under the efficient methods developed at Panama, until it was only \$0.6751 per cubic yard including plant charges and division expenses.

Concrete work has necessarily been slower, but, of the 2,046,100 cubic yards to be built,

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513,803 cubic yards were in place by the end of the year. The cost of the concrete per cubic yards was \$7.355. The lock gates were the next important consideration, and after the necessary drawings were completed and bids called for, the contract for their construction was awarded at a price of \$5,374,474. This contract calls for the erection of 40 gates, or 92 leaves and must be completed by 1 Jan 1913. The date originally set was Jan 1914, but the contractors agreed to advance the date a year. If they are able to live up to their contract it will mean that the canal may be opened nearly a year earlier than the original date fixed, which was 1 Jan. 1915.

Another important side to the work which has shown satisfactory progress are the fills which form the north and south toes of the Gatun dam east of Spillway Hill. The rock fills had reached an elevation of 65 feet above mean tide by the end of the fiscal year for 1910, and the hydraulic fills which are to form the body of the dam between the toes had reached an elevation of 51 feet. Satisfactory progress had also been made west of Spillway Hill. This was expensive work, the 2,577,204 cubic yards of dry fill costing 28.19 cents per cubic yard and the 3,000,000 cubic yards of wet fill costing 32.54 cents.

The Gatun dam which has been constructed to equalize the water supply and prevent disastrous effects from a sudden rise in the rivers has been completed in outward design and has the plan of a semi-circular arc. In it are 14 bays each 45 feet wide and it has 13 piers and two abutments. Stony gates on trains of live rollers moving on castings set in the pier keep the bays closed. The reliability of the dam can be understood from the figuring of the engineers who adapted the dam to the needs of the situation. One bay, with the gates wide open, when the lake is at 87, will discharge 11,000 cubic foot-seconds, and when all 14 are open together, they will discharge 154,000 cubic foot-seconds, while the Chagres River has never been known to discharge more than 137,500 cubic foot-seconds in 33 hours.

To do damage the Chagres River would have to rise more rapidly than it has ever been known to do. The maximum continued discharge of 137,500 cubic foot-seconds would have to continue for 9 hours and 20 minutes to raise the level of the lake one foot, and, since it would have to raise the level five feet, ample opportunity would be given, even if the operators of the canal were grossly negligent.

One of the chief engineering problems to solve in the construction of the Panama Canal has been to equalize the water supply, preventing the freshets from doing harm and being prepared to handle traffic through the canal even in the driest season. And, as to dry weather, the summer of 1908 afforded an unusual opportunity to study the effects, as it was the driest year in the past nineteen. But even during 1908, when conditions were unusually bad, there would have been sufficient water to handle four times as many vessels as pass daily through the Suez Canal. When this was figured out, the attempt was to stay well within the truth and allow more than was necessary for leakage, evaporation, and power supply.

On 25 April 1910, the sidewalls, floor, and

curtain walls of the spillway had been completed and the Chagres River was turned through it.

Of the other portions of the work, the digging of the canal from Gatun locks to the Atlantic Ocean had reached a depth of 42 feet on land before work was suspended and between the shore line and deep water, 4,500,000 cubic yards of earth were removed and 400,000 cubic yards of rock. To protect the shipping entering the canal from the Atlantic a breakwater is being extended out to the 44-foot depth at sea. Between Gatun and Culebra cut 9,497,673 cubic yards were excavated, leaving only 3,415,944 cubic yards yet to be finished. In this section the most difficult work has been in removing the higher points of land projecting above the 45-foot channel, which is to extend through Gatun Lake.

The Culebra Cut itself represents the greatest feat in excavation, 15,000,000 cubic yards of material having been removed during the year previous to the report, leaving at that time only 35,000,000 cubic yards yet to be dug out. Increased difficulty in carrying on the work has been encountered, however, on account of slides, necessitating the removal of 5,500,000 cubic yards in addition to the original estimate. To provide a basin for shipping, the canal is to be widened north of Pedro Miguel locks, adding another 1,000,000 cubic yards to the total amount of excavation yet to be done. The slides that have developed are not expected to delay the completion of the canal in any way.

The remainder of the canal, the lock sites, and approaches at Pedro Miguel and Miraflores, are keeping pace with the rest and no delay is to be anticipated from this portion of the work. From Balboa to Naos Island on the Pacific side a breakwater is being constructed which will keep the channel free from silt bearing and cross currents. The method of construction is similar to that on all breakwater work, a railroad trestle having been constructed and rocks dumped along its length.

What the figures of construction mean can hardly be understood since there is nothing with which the Panama Canal can be compared. The advantages which will accrue to the United States from its completion are much more easily grasped, as they can be expressed in terms which can be better understood.

From a commercial point of view European countries are beginning to understand what their loss will be. New York and the manufacturing centres whose output is within reach of the Atlantic Ocean will be brought much nearer to the whole of the rapidly developing Oriental countries. As to Chinese ports, the canal will give the United States no great advantage, bringing Hong Kong only 350 miles nearer to New York than at present, but even then the distance to England will be 1,600 miles shorter by the Suez Canal. With Japanese ports it will be another matter, the Panama Canal shortening New York's distance and bringing Yokohama 1,500 miles nearer to New York than London.

New York will also be brought 1,000 miles nearer to Melbourne than the Australian city is to London. New Zealand will also be brought into closer touch with the Atlantic States of America. Auckland will be within 8,550 miles of New York and 11,350 miles of London via the Panama Canal. By way of the

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Suez it is now 12,670 miles distant from London. The effect of this shortening of distances will be to bring the South Seas and the manufacturing centres of the United States much closer together, with an increased trade relation.

The *London Times* has figured what the gain in Australian trade alone will mean to the United States. Australia's imports from the United States at present are about \$35,000,000, over \$5,000,000 reaching Australia by way of Liverpool. The trade for which England and America are competing in Australia at present is of a character which will profit by the additional speed possible and the far lower cost of transportation via the Panama Canal.

Aside from the Eastern manufacturers to whom greater sales are assured in the Orient by the opening of the Panama Canal, the Pacific Coast States are expected to sell their products to much greater advantage in the European markets, being able to send them over a comparatively short course in the same bottoms, instead of depending on the long trip around Cape Horn or transporting the freight from one vessel to another overland. The Pacific ports will also profit to a large degree from the increased trade direct with European countries, a large portion of which is now handled overland in three ways. Only the heavier cargoes like cement come around Cape Horn, and very little of the trade can be sent overland at a profit, while the double handling at the Isthmus of Panama has been found to be costly on account of breakage. On this account trade between the Pacific Coast and European countries has always been at a minimum. But it is expected to increase to a large degree as soon as the Panama Canal is finished.

The right of the United States to fortify the Panama Canal has remained an unsettled question and did not take active form until ex-President Roosevelt took occasion to say in a public speech at Omaha that the honor of the United States would be sacrificed if the Canal were not properly protected. President Taft strongly endorsed Roosevelt's remarks and in his message to Congress, in Dec. 1910, recommended the appropriation of \$2,000,000 for immediate work in fortifications. The position of the United States in this matter is rather peculiar and according to several European powers, entirely neutral. On the other hand, it is quite obvious that the United States could not be expected to spend over \$300,000,000 on the canal and then leave it without protection against any foreign power which might, for selfish reasons, wish to seize it and block its use. Nevertheless the United States, in undertaking to maintain the neutrality of the canal by its own forces, will have an important if not too great a problem on its hands.

The right of the United States to fortify the canal has been attacked by England because of the Hays-Pauncefote treaty. But this treaty does not prohibit the United States from building fortifications, although it was based on the Suez Canal treaty between England and Egypt, for the seventh article of the Suez agreement to the effect that, "no fortifications shall be erected commanding the canal and the waters adjacent" was deliberately omitted in the Hays-Pauncefote treaty and the Senate of

the United States, it was understood at the time, ratified the treaty on that account. The fact that this article was omitted has generally been regarded as a tacit admission that the United States could fortify, and in the Hays-Bunau-Varilla treaty the twenty-third article provides that "the United States shall have the right, at all times and in its discretion, to use its police, and its land or naval forces, or to establish fortifications, to protect the canal."

When the question took active form Philippe Bunau-Varilla made public a letter in which he said that the provisions included the neutrality of the canal, and the absolute equality of all nations with regard to canal dues, and the right use of the canal. The employment of fortifications to protect the canal was intended as a safeguard against filibusters, local insurrections, and wars with neighboring countries. "If the United States decide to fortify the canal," he said, "they will do so in their independence as a great military power, and not by virtue of a formal concession granted them by treaty."

European nations, however, brought up the argument that, while the United States in maintenance of the Monroe Doctrine might feel called upon to maintain by force of arms if necessary the neutrality of the Panama Canal, their strategic position might in some way be affected.

Secretary of War Dickinson, in his annual report, transmitted to President Taft, 9 Dec. 1910, urgently recommended the fortifying of the Panama Canal. The report contained a request for \$7,000,000 to begin fortifications for the termini of the canal, the total cost of which is to be \$19,546,843, and also asks for \$2,000,000 to establish a naval base in the Canal Zone.

The National Board of Defense has planned to fortify the Panama Canal with the most modern and heaviest types of guns, batteries, and systems of mines. Considerable discussion of the right of the government to fortify the canal has taken place, but the fact that large quantities of supplies and ship stores for the use of vessels must be kept constantly on hand is urged a reason for protection. It has also been shown that no international reason exists against the fortifying of the canal.

Giant electric locomotives will move the shipping through the locks on the Panama Canal. These locomotives will be geared to the track by a middle rail cut into the form of a rack, giving enormous traction power. Track material to the extent of 8,000 tons will be necessary to provide for these locomotives.

The east bank of the Culebra Cut, which has caused great trouble on account of landslides, was affected by the loosening of 75,000 cubic yard of rock which moved slowly towards the canal prism and caused another delay in the work at this point during Oct. 1910. The landslide followed a fault in the rock.

On President Taft's visit to the Panama Canal in 1910 he obtained information on a number of important questions which required action by Congress. Chief of these was the question of fortification, but toll rates were also to be decided upon. This matter required comprehensive handling, as the canal, as a business undertaking, must not place prohibitive rates against shipping, much of which it can

win away from the Suez Canal by fostering. The canal will also have to compete for business with the Tehuantepec line, which makes a short land haul across Mexico, and during 1910 ordered 45 vessels to take care of its increased business.

The toll by the Suez Canal is seven francs per gross ton, approximately \$1.40. The Suez Canal is 90 miles long and the Panama Canal about 50. Federal regulation of ship supplies at both ends of the canal was also a necessary consideration. It was also decided to lay out the towns in the canal zone with the idea of uniformity of architecture and a regulation was made requiring governmental inspection of all plans. The government's policy regarding the operation of the Panama Railroad, which it owns, was also an important consideration. It was found that \$1,000,000 appropriation would be necessary to relocate it. A portion of the old track has been drowned out by changing the water flow. As soon as the water in Gatun Lake reached 22 feet it covered the tracks. From Paradise to Corozal new track was laid in 1910. The new line from Gatun to Gamboa was scheduled for completion 1 Jan. 1912.

A regulation which has been advanced for the government of the Panama Canal relates to searchlights, a matter affecting the shipping interests of the entire world. If the regulation in force at Suez is followed the searchlights required will carry a projector capable of giving light under two different conditions. A broad, flat beam will be required to illuminate both banks of the canal, to be used when no other ship is approaching, and another, breaking the light by a dark space in the middle, directing the light towards both banks, but throwing no light directly ahead, so as not to interfere with the navigation approaching.

The world had become quite complacently settled in the opinion that a "canal across the Isthmus could not be built." Even many United States' citizens—otherwise hard-headed and far-seeing—joined in this pessimistic cry. Yet, within a few years time, and at comparatively moderate cost in money and no unnecessary cost in lives, the backbone of the Continent has been broken, and the two oceans, long pounding almost within earshot of each other are about to be united. It was the "Open Sesame," not only of the highest type of engineering skill, but of the most advanced sanitary science that has accomplished this. Col. W. C. Gorgas organized a campaign of sanitation that changed pestilential Panama into the most healthful spot in the tropics, banished the mosquito and yellow fever, and made possible the achievements of Colonel Goethals and his 45,000 men. The care and organization of these men, whose every interest—physical, mental, social, moral, educational and religious—is looked after, constitutes a chapter in humanitarian science that has won its own triumphs. Those who pass through the canal in the coming times will naturally be most impressed with the achievement as a veritable monument of engineering skill; but no view of the finished work, or account of its inception and progress, is complete that does not take note of the sanitary and industrial preparations and conditions that made the great work possible. See MESSAGE, PRESIDENT'S.

Pan Islamism. The spread of Islamism in certain parts of Asia and even in Europe has led one writer to call it the most vital influence in the world to-day. "It is the only faith," he says, "whose precepts form the basis of civil law throughout all the countries in which it is dominant. It is making converts more rapidly than all other religions combined. Its agents are swarming through all the territories of the Old World. They have civilized immense regions of central Africa and have built up the scattered pagan tribes into powerful communities; they are permeating the East Indies; they are breaking down the caste degradation of India, a mosque has been built in Liverpool and another is projected for New York City. Before this triumphant progress many world-evils are scattered, the usurer, the gambler, alcohol, and all the debasing practices of pagan peoples."

There are alleged to be three mediums through which the new heaven is working. The first of these is the educational centre of Cairo. At the old El-Azhar University 10,000 students receive free tuition from the faculties of theology and jurisprudence, and the Gordon College, at Khartum, has an immense influence throughout the whole of the Sudan. The second medium is the press. News of the chief occurrences of the modern world is now transmitted daily to scores of newspapers in Egypt, Turkey, Persia, and other Oriental countries. The third medium is the new railroad between Damascus and Mecca, which will convey thousands of pilgrims annually to the Sacred City and greatly increase the intercourse of Moslems from all parts of the world. The awakening of the Mohammedan peoples is said to be becoming everywhere more and more manifest. Persia has established constitutional government. Afghanistan has schools and factories, freedom of faith, and, to us the supreme test of civilization, an arsenal manned by native workmen, and a well armed standing militia of 100,000 men. The petition of Mohammedan women, subjects of Russia, to the Duma, demanding equal rights and the suffrage, was in 1910 the subject of comment in the American and European press.

Paper. The Census Bureau announced in its annual report issued Oct 1910 that 4,002,000 cords of wood had been made into paper during the year 1909 and that the cost of the transformation was \$34,478,000. This was an increase of 650,000 cords over 1908 and 39,000 over 1907. The advancing cost of wood pulp of all kinds increased the outlay in 1909 over that of 1907 more than \$2,000,000, although the increased production was small. The report pointed out the decrease in the use of spruce for paper making. While still the most popular wood for the purpose, there has been a steady falling off, the percentage of that material being 65 per cent in 1909, 64.5 per cent in 1908, and 68.1 per cent in 1907. The price in the meanwhile had increased more than a dollar a cord. The use of hemlock decreased also. Corresponding increases were made by balsam, white fir, and several hardwoods, including birch, beech, maple gum, and bass wood. White fir, which is in increasing demand, is common in many of the national forests. Of the 2,421,000 cords of spruce consumed in 1909 770,000 were imported.

PAPER TRUST — PARAGUAY

It has been found that wood pulp paper is used to a much greater extent than formerly and that the quality of this paper is such that it will not endure like the cloth papers. Librarians have complained of collecting books which could not possibly remain intact. Only about 12 per cent of the modern books are printed on cloth paper. In time the others collected in libraries will become useless.

The tariff on paper under the Payne-Aldrich law is such as to keep foreign paper manufacturers off the American market. At the close of 1910, however, this had not had the effect of increasing the price of paper and affected the market only in respect to quality. The best paper is made of pure hemp and linen. The next lower class is composed of cotton and linen, and the lower grades are made of cotton rags and wood pulp. The cheapest paper contains only wood pulp.

Paper Trust. See TRUSTS.

Papua. British territory in New Guinea; comprises the southeastern portion of the island and includes the D'Entrecasteaux and Louisiade Islands, together with other small islands, and those lying in the Gulf of Papua. The western and northern boundaries are formed by Dutch and German New Guinea. The area of the colony is about 90,540 square miles. The population is 500,000, approximately; there are about 1,200 foreigners, including 700 Europeans. There are four good ports, viz.: Port Moresby, Samarai, Daru, and Bonagai—all on Woodlark Island. Christianity and secular instruction are imparted to thousands of the natives by the missionaries of four societies. The Papua Act of 1905 changed "British New Guinea" to the "Territory of Papua," and gave the country, formerly administered by Australia and supported by a colonial appropriation amounting annually to \$75,000, over to the Federal Government. There are a Lieutenant-Governor, also the Chief of Justice, and a Secretary. The Government leases but does not sell Crown lands. For judicial purposes the country is divided into eight districts, in all of which there are petty native officers of the law and justice. There is a Central Court at Port Moresby. The Government receipts for 1908-09 amounted to \$135,050, and the expenditure to \$252,650; the Australian grant to about \$115,000. The gross revenue for 1909-10 was about \$309,000, and the expenditure about \$324,000. Customs duties afford the most lucrative source of revenue. Postal matter to the extent of 90,600 letters, and 61,300 parcels and newspapers, passed through the postoffice in 1906-07. A large percentage of the land is cultivated, and agriculture is extending. Cocoanuts are raised on 250,000 acres. Other important products are cotton, vanilla, kapoc, tapioca, cinnamon, tea, and tobacco. Valuable forests exist, containing timbers, sandal-wood, ebony, gums, rattans, sago palm, etc. Gold is mined, the output in 1908 being worth about \$257,550. The leading articles of import into Papua are food produce, tobacco, hardware, and drapery; the exports abroad are chiefly copra, pearl shell, gold, pearls, sandal-wood, coffee, rubber, and trepang. The value of the imports in 1908-09 was approximately \$461,550; and the total exports amounted to about \$388,500. The commerce of the previous year was valued at more than \$851,500. The shipping at the ports registered over 224,200

tons in 1909. The preponderance of trade is with Queensland and New South Wales, Australia. Internal traffic is carried on, in some localities, over the inland waterways.

Paraguay. A Republic in South America.

Area and Population.—There is a territorial dispute between Paraguay and the Bolivian Republic, but the area may be put at 196,000 square miles. The population in 1908 was about 715,840, of whom 50,000 were Indians, and the balance mixed races. In the 1900 population there were 9,300 Argentines, 2,700 Italians, 1,400 Brazilians, 1,100 Spaniards, 900 Germans, 800 French, 400 English, and 600 (other) South Americans. The chief town and seat of Government is Asuncion, with about 52,000 inhabitants. Villa Rica has 30,000 inhabitants; Concepcion, 25,000; San Pedro, 8,000; Carapegua, 7,000; Paraguari, 10,000; Villa del Pilar, 10,000, etc. More than 1,000 immigrants entered the country in 1908.

Government and Finance.—Administrative divisions in the Republic are counties, of which there are 23, locally governed by councils and chiefs. The people are actively concerned in their own government, every 12,000 of the inhabitants sending one representative to the House of Deputies, and 2 members to the Senate. The salary for both Senators and Deputies is \$1,000 per year. The President exercises executive functions through a cabinet of 5 ministers in charge of the departments of the Interior, of Finance, Worship and Justice, War, and of Foreign Affairs. His salary is about \$9,500; he is assisted by a Vice-President, with an allowance of \$4,800. The country became independent of Spain in 1811. The present constitution dates from 1870. The revenue of the Government for 1910 was about \$2,161,000, and the expenditure estimated at \$2,579,750. Customs, stamp dues, and the sale of timber are important sources of revenue. The external debt of the country at the end of 1909 was about \$4,053,800. There is a national bank in the Republic, with a capital of \$6,000,000. The Conversion Office, capital about \$210,000, receives about \$150,000 yearly from specific duties. The Agricultural Bank has a capital of about \$1,000,000, the Paraguayan Bank a capital of approximately \$2,100,000. There are also other financial institutions. The gold "dollar" is worth about \$1.00, the paper, about 7 cents, 1908.

Justice, Religion, and Education.—There are justices of the peace in all the counties, various minor courts throughout the Republic, and a High Court of Justice at the capital. The State religion is Roman Catholic. There is, however, religious freedom in the country. The Government supports education, maintaining 42 pupils in Europe in 1903, and granting general aid. At Asuncion there is a National College, with 15 professors and more than 200 students. In 1907 there were about 550 schools, with 800 teachers, and a total enrollment of 41,000. Besides these there are private schools, several Protestant schools for boys and girls, and an agricultural school with a model farm. Elementary education is obligatory as well as gratuitous.

Agricultural and Industrial Resources.—Tobacco is one of the principal products. Oranges are a fine crop; Paraguay tea is cultivated; maize, manioc, and beans are grown.

PARALYSIS—PARET

The New Australia Colony, inland, produces maize, cassava, beans, sweet potatoes, sugarcane, bananas, oranges, and peaches; and they have stores, a saw-mill, and liquor works. Live stock in 1908 included about 5,500,000 cattle, 182,800 horses, 7,600 donkeys, 214,000 sheep, 32,350 goats, and 23,900 swine. The stock-raising industry is a great resource to the Republic. The forests produce medicinal plants, and much valuable timber.

Trade and Shipping—The leading imports into Paraguay are textiles, provisions, hardware, liquors, drugs, and clothing. The value of \$1,151,600 in imports came, in 1908, from Germany; \$834,000 from Great Britain; \$754,500 from Argentine Republic; \$357,400 from France; and \$281,000 from Italy. Total imports in that year amounted to about \$3,971,150. The exports are chiefly dried meat, hides, yerba, oranges, tobacco, timber, and some tea, amounting in 1908 to the value of about \$3,770,400. The imports and exports for 1909 amounted to \$3,693,250, and \$5,008,200, respectively. There is a commercial arrangement with Great Britain. All British trade passes through Brazil and Argentina. Vessels entered and cleared at the port of Asuncion in 1908, about 1,200, most representative of Argentine and Brazilian trade. Steamers visit the port regularly. Asuncion will shortly be en route of New York liners up the Plata River, monthly service.

Posts, Railways, and Telegraphs—There were about 225 postoffices in the Republic in 1908. Receipts for the year aggregated approximately \$25,300. Paraguay belongs to the postal union. There is a line of railway 155 miles in length, owned by an English company. The country is greatly in need of more railways, and also of better roads, which are little better than passes or paths. There are about 1,960 miles of telegraph line, operated through 64 offices, and a telephone system working at the capital. There are telegraphic connections with the Argentine Republic wires, and thence with world systems.

History, 1910—A presidential decree on 6 Aug. 1909, authorized the establishment of a mortgage bank in Asuncion with a capital of \$2,000,000, operations to begin when one-fourth of the capital has been subscribed and to continue for 50 years, or at the discretion of the executive. On 30 July 1909, the Government formally approved the arbitration convention signed on 13 March by the Minister of Foreign Relations, and the Sec. of State of the United States, Hon. Elihu Root. A law has recently been promulgated providing that patent medicines, domestic or foreign, shall not be placed on sale without authority from the National Department of Health, and a detailed statement of the chemical contents, by elements, must be printed on each receptacle. In September 1910, Dr. Manuel Gondra was elected to the presidency. Doctor Gondra was formerly Minister to Brazil and more recently Minister of Foreign Affairs.

Paralysis, Infantile. See INFANTILE PARALYSIS.

Parcels Post. The campaign carried on for a number of years to bring about a parcels post system, making it possible to take advantage of the postoffice in the forwarding of ordinary packages took a decided forward movement

during 1910, partly on account of increased rates charged by the express companies, but also due to the publicity given to the fact that the Postoffice Department would be able to take greater advantage of its rural delivery routes if a parcels post were put into effect. Opposition to it has been concentrated in the fear that a mail-order trust would be formed that would greatly alter business conditions.

The Postal Reform League, one of the most powerful organizations devoted to this subject, circularized the country with pamphlets showing the limitations of the postal system and pointing out possible means of making it pay. The fear that the postage on magazines would be raised also caused the popular periodicals in their own defense to investigate the Postoffice Department and point out methods by which the department could be placed on a paying basis without taking a step which they regarded as inimical to them. The Postal Reform League pointed out discrepancies between our postal department and those in other countries, maintaining that more liberal measures could be successfully used here. Such examples as the following were used in argument: The limitation on weight in this country is 11 pounds at the rate of 12 cents a pound. In Germany the rate is $\frac{1}{4}$ of a cent a pound. A low rate would also be possible in this country, it was maintained, if the postal department were able to handle a portion of the business on which the express companies now have a practical monopoly. The Postal Progress League carried on its campaign on the assumption that the Postoffice by limiting its activities arbitrarily has violated a business law and can only be made a paying institution by handling economically all the business possible with its facilities. As to facilities, the argument has been strongly put forward that the rural mail routes are now traversed by practically empty wagons, causing a large deficit, while with a parcels post these wagons would be full and not create a deficit. The parcels post regulations in effect at the close of 1910 provided for a rate of 12 cents a pound; a length of 3 feet, 6 inches, and combined length and girth 6 feet. Maximum weight 11 pounds.

Paret, William, sixth P. E. bishop of Maryland, 137th in succession in the American episcopate; dean in years of the house of bishops in 1911, the 15th of the living American bishops in order of precedence in the House of Bishops; b. New York City 23 Sept. 1826; prepared for college at Columbia Grammar School and was graduated at Hobart College A.B. 1849, and prepared for holy orders under instruction from Bishop Delancey. He was admitted to the diaconate by Bishop Chase in 1852 and advanced to the priesthood in 1853. He was rector of St. John's Church, Clyde, N. Y., 1852-54; of Zion Church, Westchester Co., N. Y., 1854-64; of St. Paul's, Saginaw, Mich., 1864-66; Trinity, Elmira, N. Y., 1866-68; Christ Church, Williamsport, Pa., 1868-76, and of the Church of the Epiphany, Washington, D. C., 1876-84. It was during this pastorate that he was called to be successor to the Rt. Rev. William Pinkney, who had served the diocese as prelate 13 years. He was consecrated in his own church in Washington, 8 Jan. 1885, by the Rt. Rev. Alfred Lee of Delaware. Hobart College conferred on him the honorary degree of D.D. in 1867, and of LL.D.

PARIS—PARISH SCHOOLS

in 1880. He originated the Diocese of Washington, created out of his own Diocese of Maryland, by the surrender of the territory included in the District of Columbia and the counties of St. Mary's, Charles, Prince George's, and Montgomery of the State of Maryland and comprising a population of 314,667 souls at the time of the organization in 1895. He declined to accept the bishopric of the new diocese, electing to remain with the old diocese of Maryland out of which he had consented to have cut so important a portion as the District of Columbia including the City of Washington, the national capital. His important books are 'St. Peter and the Primacy of the Roman See,' 'Our Freedom and our Catholic Heritage,' and 'The Method and Work of Lent.' In 1909 Bishop Paret, having reached the advanced age of 83 years, was given a coadjutor in the person of Bishop John Gardiner Murray (qv).

Paris. See FRANCE.

Parish Schools. The parish or parochial schools belonging to the Catholic Church in the United States are, as a rule, nearly as old as the churches to which they belong. The system itself is practically coeval with the American Catholic Church. Old St. Peter's, in Barclay street, New York, the first Catholic church founded in New York, and one of the first in the country, had its parochial school more than a century ago, and this was the first free school in the city of New York. Wherever there seems a prospect that a school can be maintained, the first duty of the priest in charge of a new parish is to found the school and if possible build a schoolhouse, in which he sometimes acts as teacher, but more often delegates this duty to a lay teacher or to nuns of some one of the various teaching Orders with which his parish may be affiliated. In a Polish parish the Felician Sisters, an order of Franciscan nuns founded in Poland in 1855, are nearly certain to be called in to take charge of the schools; in a German parish it may be the Sisters of a German Order of St. Francis, or if the priest happens to be a member of the Society of Jesus, a Dominican or a Franciscan, he will be most likely to invite into the parish the Order of nuns with which his own Order is connected. The Sisters of St. Dominic, the Sisters of St. Benedict, and the School Sisters of Notre Dame are all teaching sisterhoods, although they are often found in charge of other work as well. Thus the enormous labor of maintaining these schools has been distributed along lines of natural development. Its extent may be seen from the fact that there are in the United States 4,703 parochial schools in which are enrolled 1,197,913 children. The total number of Catholic churches in the country is 12,923, and the total number of Catholics about 14,235,450. It will be seen, therefore, that more than one-third of the churches maintain schools in which the average number of pupils is 253, and it may be said in a general way that the bulk of these schools are found in cities and large towns.

These statistics do not, of course, include schools such as convent academies, colleges for priests and for Catholic young men, or schools in orphanages and other institutions, so that the figures for the schools strictly parochial do not by any means cover the whole number

of pupils educated in Catholic schools. In the early days of the Catholic church in America it was usual for the children of Catholic parents to attend the public school until they reached an age to be sent away to school, when, if the parents could afford it, the girls usually finished their education at a convent. The Ursuline Sisters, who in Europe have always been cloistered nuns, became in America teaching Sisters, and the Ursuline Convent in New Orleans and other convent schools conducted by this Order are famous throughout the country. Other sisterhoods, like the School Sisters of Notre Dame and the Sisters of Charity of the Blessed Virgin Mary, have been founded especially for the work of educating Catholic youth, particularly young girls. Among the teaching Orders of men the Christian Brothers are perhaps the best known, but other Orders are the Brothers of Mary and the Xavierian Brothers, members of which usually take charge of the boys' division of the parochial school when the number of pupils warrants the employment of several teachers. There are many schools, however, in which the entire work of teaching both boys and girls up to the age of graduation from the grammar school, is in the hands of the Sisters of some Order. As a rule, the number of boys is slightly under the number of girls, perhaps 10 per cent in some cases, and in a few schools the boys outnumber the girls. Other sisterhoods than those already mentioned are, the Sisters of Christian Charity, the Sisters of the Holy Cross, the Ladies of the Sacred Heart, and the Sisters of Mount Carmel. The last two mentioned are in charge of most of the schools in the city of New Orleans.

A peculiarity of the parochial school which distinguishes it from the public school is that in it the children of each nationality are taught, as the church of each nationality is formed, separately. There may be here and there Irish children in a city parish made up mainly of Germans or Italians, but as a rule, when the people of any nationality are strong enough in any one place to support a church and priest of their own people, they get one. With the church comes the school, in which the teacher is often of the same traditions as the children, whereas in the public school no such segregation is possible. When the children reach high school age, however, they either leave the parochial school for the public high school, are sent to private schools, or if there is a Catholic high school the graduates of the various grammar schools go to that. The city of Boston, with its suburbs, has 76 parochial schools and 22 Catholic schools of high school grades, in which are enrolled altogether 50,352 children under 900 Sisters, 81 teaching Brothers and 45 lay teachers. The number of children in these schools ranges from 1,100, 800 and 900 in the larger schools to 58 in the smallest, though the school in the parish of Our Lady of Help has about 2,000 pupils,—962 boys and 1,031 girls. The usual number of pupils is from 300 to 400.

In Chicago, the Polish parishes of St. John Cantius and St. Mary of Perpetual Help maintain schools with 1,408 and 1,535 pupils respectively, St. Stanislaus Kostka has its school in charge of 65 School Sisters of Notre Dame, with 3,940 pupils; the school of St. Charles

PARISH SCHOOLS—PARKER CENTENNIAL

Borromeo, an Italian saint, has 1,387 pupils; St Michael's, German, has 1,830; and these are typical. In Buffalo St Ann's parish, German, has a school of 1,505 children in charge of the Sisters of St Francis, the Polish parish of St. Stanislaus has a company of Felician Sisters numbering 55, in charge of 1,815 children. In New York, where for many years the scarcity of schoolhouses has forced the Board of Education to arrange part-time classes, the 278 parochial schools take care of 69,617 children, and this does not include Brooklyn, with its 73 parochial schools enrolling 51,367 pupils. The parochial schools in New York have had among their pupils many priests now of national reputation. This is also the case in Baltimore. Baltimore has a large number of parochial schools in proportion to her population, there being 45 parish schools, with 13,899 pupils, in the city itself, and in the archdiocese there are 95 schools and 21,711 pupils.

New York has 142 Catholic churches, 86 schools for boys with 26,841 pupils, and 86 schools for girls with 29,852 pupils. These boys' and girls' schools coexist in the same parishes, Catholic tradition being opposed to the education of boys and girls in the same classroom. It may be stated that the coeducational school practically does not find place in Catholic parishes, and only exists temporarily in some small parish where there is as yet but one teacher and one schoolroom for perhaps 25 or 30 young children. The usual number of teachers in a school varies but slightly; 40 or 50 pupils to each instructor is the ordinary number.

The course of education in the parochial school, technically speaking, approximates rather closely to the lines of the ordinary public school. In New York the students in Catholic schools pass the regents' examination. Music usually receives especial attention.

The following table gives the number of schools and pupils in each archdiocese and diocese in the United States. The lines of the diocese do not, of course, coincide with the lines of the city or State from which it derives its name, the archdiocese of Baltimore including the State of Maryland and the District of Columbia, while that of Chicago includes but little more than the city itself, and the State of New Jersey is divided between the diocese of Newark and that of Trenton. Catholic mission work in the greater part of the South is of comparatively recent origin and except in old Catholic settlements like that of New Orleans the schools, like the churches, are few and not largely attended, scattered over a large territory. Indian schools are carried on by a special order, the Sisters of the Blessed Sacrament for Indians, and the Oblate Sisters, an Order of colored women, have charge of a few schools for colored people. The statistics are taken from the Catholic Directory for 1909.

Archdiocese or Diocese	Schools	Pupils
Baltimore...	95	21,711
Boston	98	50,352
Chicago	285	87,040
Cincinnati	215	28,665
Dubuque	96	25,000
Milwaukee	139	32,561
New Orleans	95	14,572
New York	278	69,617
Oregon City	30	4,500
Philadelphia	146	61,048

Archdiocese or Diocese	Schools	Pupils
St. Louis	173	30,015
St. Paul	53	21,750
San Francisco	37	17,000
Sante Fe	12	1,270
Albany	47	17,657
Alton	65	8,759
Altoona	27	7,426
Baker City	5	705
Baltimore	70	8,520
Boise	7	1,155
Brooklyn	73	51,367
Buffalo	104	30,627
Burlington	20	5,823
Charleston	5	817
Cheyenne	2	150
Cleveland	185	44,275
Columbus	54	10,446
Concordia	25	3,000
Croftington	37	7,233
Dallas	29	3,240
Davenport	48	4,752
Denver	26	6,520
Detroit	70	23,086
Duluth	10	1,500
Erie	44	10,050
Fall River	24	10,630
Fargo	32	2,020
Fort Wayne	82	14,757
Galveston	32	5,000
Grand Rapids	66	13,547
Great Falls	5	617
Green Bay	104	16,421
Harrisburg	36	8,000
Hartford	78	32,000
Helena	20	4,590
Indianapolis	108	15,097
Kansas City	42	5,543
La Crosse	74	9,475
Leadville	5	1,020
Leavenworth	39	5,700
Lincoln	25	1,229
Little Rock	39	2,151
Louisville	70	11,225
Manchester	37	12,600
Marquette	23	6,050
Mobile	31	4,132
Monterey-Los Angeles	30	6,576
Nashville	22	3,302
Natchez	19	3,661
Natchitoches	16	2,100
Newark	110	50,000
Ogdensburg	15	3,739
Oklahoma	32	5,576
Omaha	75	8,267
Peoria	70	11,360
Pittsburg	123	39,626
Portland	28	10,675
Providence	30	17,818
Richmond	11	5,728
Rochester	53	18,284
Rockford	22	3,750
Sacramento	11	562
St. Augustine	18	2,976
St. Cloud	26	4,000
St. Joseph	12	1,924
Salt Lake	5	515
San Antonio	36	6,610
Savannah	13	2,064
Scranton	45	14,130
Seattle	26	4,534
Sioux City	48	7,150
Sioux Falls	23	2,590
Springfield	56	22,973
Superior	22	4,675
Syracuse	18	7,388
Trenton	45	12,303
Tucson	7	1,200
Wheeling	14	1,975
Wichita	36	1,911
Wilmington	13	3,560
Winona	28	4,630
Brownsville	9	1,100
North Carolina	7	579
Alaska	8	297
Total	4,793	1,197,913

Parker Centennial. The 100th anniversary of the birth of Theodore Parker was celebrated at Chicago in Nov. 1910. The celebration took the form of a congress held conjointly by the Congress of Religions, the Free Religion Association of America, and the National Federation of Religious Liberals. The topics treated included 'The Rights of the Negro,' 'The Cause

of the Laborer,' 'The Advancement of Women,' 'Abolition of War,' 'The Proper Use of Talents, Wealth and Opportunities,' 'The Right Treatment of Crime,' 'The Moral Influence of the Home,' 'The Modern Church,' 'Biblical Criticism in Parker's Time,' and 'Today, the Sympathy of Religions.'

Parker, Edward Melville, coadjutor P. E. bishop of New Hampshire, and 229th in succession in the American episcopate: b Cambridge, Mass, 11 July 1855. He attended St. Paul's School, Concord, N. H., 1868-74, and was graduated from Keble College, Oxford, Eng., A.B. 1878, A.M. 1881, took a post-graduate course at Oxford University, 1878-79, and was a master at St. Paul's School, 1879-1906. He was ordered deacon in 1879 and ordained to the priesthood in 1881. In 1906 he was elected coadjutor to the Rt. Rev. William Woodruff Niles, bishop of the diocese of New Hampshire, and was consecrated 9 Feb. 1906, Bishops Niles, Lawrence, and Hall officiating. The honorary degree of D.D. was conferred on him by Berkeley Divinity School in 1906, and that of D.C.L. by Bishops College, Lenoxville, Canada, in 1907.

Parks. The settlement of the country and easy access to the large reserves, classed as national parks, caused Secretary of the Interior Ballinger in his annual message to the President in 1910 to suggest that a bureau of national parks be created. The work of this bureau he outlined as providing better roads and trails, the purchase or other elimination of private land grants within the reserves, the securing of legislative authority to secure proper policing, the introduction of sanitary regulations, the removing of dead timber, and the establishment of better systems of telephone and telegraph lines. A single commissioner with a corps of engineers and experts is the Secretary's plan. The national parks in existence at the close of 1910 were: The Yellowstone, containing 2,142,720 acres; Yosemite, 719,622 acres; Glacier, 915 acres; Mt. Rainier, 207,360 acres; Sequoia, 161,597 acres; General Grant, 2,536 acres; Crater Lake, 159,360 acres; Wind Cave, 10,522 acres; Sully's Hill, 780 acres; Platt, 842.22 acres; Mesa Verde, 42,376 acres; Casa Grande Ruin, 480 acres; Hot Springs Reservation, 911.63 acres. Of these the latest addition in 1910 was the Glacier Park in Montana. Within its limits are 250 lakes, more than 60 glaciers, and a great variety of scenery. The park is reached via the Great Northern Railway.

Parochial Schools. See PARISH SCHOOLS.

Parting-of-the-Ways Home. The "Bridewell," which is the popular name by which the Chicago House of Correction is known, discharges every day in the year about 30 hopeless outcasts of society who have served varying sentences for offenses ranging from the most trifling misdemeanor to assault with intent to kill. Formerly about one-half of this number repeated their offenses and again found their way back to the institution. Latterly, however, that percentage has been steadily decreasing, and this fact is due directly to the influence of the Parting-of-the-Ways Home, Chicago's "new man-factory," which confines its efforts to the regeneration of discharged prisoners. R. H. McBride is the manager and prime mover in this home. He, or one of his assistants,

takes occasion to meet the prisoners soon after they come out of the House of Correction, offering them a free night's lodging and a meal. Although suspicious, the discharged ones seldom fail to accept, for it is the only means of which they know to procure these things. During that one night Mr. McBride usually gets the life story of each man. In almost no instance is there one who has not at some time or other had a trade. McBride gets each man a job at whatever trade he knows, fits him out with clothes, and sends him to work with the feeling that he is on his honor—that he can pay for his night's lodging and his meals by making a man of himself and leaving crime permanently behind.

This course of treatment hardly ever fails. Most men want to do right, and if given a fair trial they will do right—all the more so because they have seen the folly of doing otherwise. This much the Parting-of-the-Ways Home has proved. Mr. McBride was holding Sunday services in jails when a satirical comment from a Chicago justice who had no faith in men caused him to open his home in a modest tenement on the city's south side. Mr. McBride says that it costs the city \$6 to send a man to the House of Correction, and leave him without hope in the end. For fifty cents less Mr. McBride will make a new man of him.

Partridge, Sidney Catlin, first missionary P. E. bishop of Kyoto, and 195th in succession in the American episcopate: b New York City, 1 Sept 1857. He graduated from Yale A.B. 1880 and from the Berkeley Divinity School, Middletown, Conn., B.D. 1884, and D.D. 1900. He was ordered deacon in 1884 and ordained to the priesthood in 1885. He went to China as a missionary in 1884 and resided in Shanghai where he was a teacher at St. John's College and chaplain of St. Mary's Hall, until 1887 when he removed to Wuchang and became rector of Boone University and served as a missionary. In 1898 the Japan mission was divided by the general convention into the two missionary districts of Tokyo and Kyoto, which are also separate dioceses of the Japan church. Doctor Partridge was elected first bishop of the missionary district of Kyoto, and he was consecrated 2 Feb. 1900 by the bishop of Tokyo, the bishop of Shanghai and the former bishop of Shanghai acting as co-consecrators, and the bishops of Osaka, Kyushu, Hokkaido, and South Tokyo acting as presenters. In 1910 his district supported 14 foreign and one native presbyters, seven native deacons and eight candidates for holy orders, besides 33 foreign teachers and workers.

Passion Play, a mystery, or miracle play, representing the different scenes in the passion of Christ, and presented every ten years by the inhabitants of the village of Oberammergau, Bavaria. This festival was last held in 1910, from 11 May until the last week in September. During that time there were fifty-nine performances; records show that 225,000 persons attended the play in the summer of 1910; eighty per cent of these were Americans and 15 per cent Britons. As Oberammergau is somewhat difficult to reach, being off the main line of travel, special accommodations were made by which the tourist could more easily get to the village. Special trains and trolleys were run

PASSION PLAY — PATENTS

from Munich which, forty-three miles away, is the nearest railroad centre. A garage was built for the accommodation of tourists who came by motor.

Tourists were advised, by those in charge of arrangements, to arrive in the village not later than two o'clock of the day preceding the performance for which they had engaged tickets. The play was not given every day in the week, but was usually performed two days in the week; one of these was Sunday and the other either Wednesday or Thursday. The performances began at eight in the morning and continued until six in the evening, with an interval of two hours for refreshments.

For the performance of the play in 1910 a new iron building was erected, with a seating capacity of about 4,400. The stage, 150 feet wide, has been built without a roof, according to the custom which has always been followed in the giving of this play. It is open to the sky and has, as a background, the wooded peaks of the mountains. In the centre of the stage is an inner stage, with scenery and drop curtains. At either side are balconies and, stretching far back, there are two streets of Jerusalem.

As the play begins, an unseen orchestra plays an old Gregorian chant and the chorus of nineteen men and women file in, dressed in long tunics of white, long red cloaks, and with crowns upon their heads. The leader, or Choragus, recites the prologue and then the chorus chants the theme which is to be revealed in the tableaux. The Passion Play is divided into three parts with seventeen scenes, besides the introduction and conclusion. During the singing of the last stanzas of the prologue, the curtain rises upon two tableaux, Adam and Eve being driven out of Paradise, and Abraham preparing to offer up Isaac. The duty of the chorus is to make a kind of running commentary on the play; this is done by means of beautiful songs.

Permission to copy the music is never given; only the words of the chorus songs are put into print. The text of the play has never been published. The play-text in its present form was compiled and written by the village priest; the music was composed by the village schoolmaster. The performers commit their parts to memory from written manuscripts. The deep devotion which the villagers give to the play has kept it remarkably free from theatrical devices and customs.

This play, which attracts thousands of visitors from all over the world, originated from a vow made by the inhabitants of the little village of Oberammergau in 1633, that they would, every ten years, "enact a play which should set forth the life, death and mediation of the Redeemer." Their motive in making the vow was to obtain mercy from heaven in checking the black plague which was at that time devastating their village. The plague ceased after the first performance of the play, which took place in 1634. The peasants firmly believed that this mercy was granted because of the giving of the play.

Every decade thereafter the play was given, but in 1674 it was decided to postpone it until 1680 so that each representation in years to come, would mark the beginning of a decade. In 1870 the performances were interrupted by

the Franco-Prussian war but were concluded the following year, 1871. An extra performance was given in 1815 to celebrate the peace which the Battle of Waterloo brought to Europe. Both of these performances, out of the regular dates, were considered as special representations and for them permission from the Pope was obtained.

At present, the play is not Roman Catholic in its presentation. There is almost nothing of the Catholic ritual in it. In the scene where Jesus makes his triumphal entry into Jerusalem, he raises his hand in blessing but he does not make the sign of the cross, in the acting of the Lord's Supper, Christ, himself, holds the cup to the lips of each partaker, but this usage is Lutheran and Episcopalian as well as Roman Catholic. It is the incomparable story of the Gospels that is presented with impressive simplicity and tragic solemnity.

One reason why this play has been so successfully presented for 270 years comes from the fact that it is not the effort of a few individuals but represents the united zeal of the whole community. The Town Council of Twelve, with the addition of six citizens, chosen by the village, manage the play. Their most important duty, and the one to which they devote many hours of serious contemplation and prayerful meditation, is the choosing of the candidates who have applied for the different roles. To be permitted to enact one of the principal characters is regarded as the greatest honor that can come into a man's or a woman's life. No person is allowed to act whose morals and conduct are not above reproach. Altogether, 685 persons take part in the play. After the parts are assigned, the utmost devotion is demanded from every person taking part in the play. During the year in which the play is given, no festivity, not even a public wedding, is permitted in the community.

A Lutheran passion play is to be put on the stage next August at Eisenach in the Grand Duchy of Saxe-Weimar. The drama to be produced will be the work of Carl Weiser, of the Weimar Theatre. It will resemble the Oberammergau passion play, but will be in accordance with Lutheran ideas.

Patents, United States. Patents are issued in the name of the United States to any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter. Every patent contains a grant to the patentee for the term of 17 years of the exclusive right to make, use, and vend the discovery throughout the United States. Application for patent must be made to the Commissioner of Patents. The receipts of the Patent Office during the year ending 31 Dec. 1909 were \$2,042,828, and expenditures \$1,955,151; receipts over expenditures, \$87,677. The following are some statistics of the business of the office for the year ending 31 Dec. 1909: Number of applicants for patents, 64,408; applications for design patents, 1,234; applications for reissue patents, 197; total, 65,839. Number of caveats filed, 1,948; applications for registration of trademarks, 7,247; applications for registration of labels, 554; applications for prints, 190; disclaimers filed, 8; appeals on the merits, 1,450; total, 11,397. Number of applications requiring investigation and action, 31 Dec. 1909, 19,679.

PEABODY EDUCATIONAL FUND—PEACE MOVEMENT

Number of patents granted in designs, 37,296; patents reissued, 160; total, 37,421. Number of trade marks registered, 4,184; number of labels registered, 492; number of prints registered, 1,48; total 4,824. Number of patents expired, 22,661; number of patents forfeited for non-payment of final fees, 7,699, number of applications allowed awaiting final fees, 12,748; number of trademark applications passed for publication, 4,517. The total number of applications filed at the Patent Office in 72 years, 1837-1909, was 1,652,062; number of caveats filed, 129,201; number of original patents issued, including designs and reissues, 998,497, net surplus in the United States Treasury on account of the patent fund, \$6,978,402. The number of patents issued by foreign countries and the United States from the earliest records to 31 Dec. 1909 are as follows: United States 954,966; all other countries, 2,044,767.

Peabody Educational Fund. At the annual meeting of the board of trustees, held 3 Oct. 1910, steps were taken towards the dissolution of the Peabody Educational Fund and the distribution of the remainder of the funds in compliance with the clause designating 30 years as the period of its duration.

During that year two members of the board had died, viz Chief Justice Fuller, and Senator John W. Daniel, of Virginia. Of the other 14 there were present Joseph H. Choate, former ambassador to Great Britain, who was made chairman; Richard Olney, former attorney-general of the United States; Dr. Samuel A. Green, librarian of the Massachusetts Historical Society, secretary of the board; ex-Gov. James D. Porter, of Tennessee, J. Pierpont Morgan, Judge Charles E. Fenner, of Louisiana, ex-Gov. Hoke Smith of Georgia, Bishop Doane, of Albany, Bishop Lawrence, of Massachusetts, Grenville Winthrop, of New York, and Gov. Martin Ansel, of South Carolina. The absentees were Judge Henderson M. Somerville, of Alabama, Senator George Peabody Wetmore, of Rhode Island, and Col. Theodore Roosevelt.

The Peabody Educational Fund was established in 1867 by George Peabody. He was a native of South Danvers, Mass., which in his honor was afterwards named Peabody. After accumulating a fortune in America he went to London, England, and established the banking house which bore his name. During his lifetime Mr. Peabody was a most notable philanthropist. To Baltimore he gave more than \$1,000,000 inclusive of the sum with which the Peabody Institute was established; he made large gifts to South Danvers, to Salem, Boston, and other cities; to Harvard and Yale each he gave \$150,000, and established a fund of \$2,500,000 for the building of lodging houses. In 1867 Mr. Peabody put in the hands of a board of trustees securities to the value of \$2,100,000 to which he later added \$1,384,000. Two years later he died. Of the total sum, \$1,484,000 represented Mississippi and Florida State bonds which were afterwards repudiated by those States, thus materially reducing Mr. Peabody's bequests.

The trustees were enjoined to use the substantial sum remaining for the promotion of education in those Southern States where it would seem likely to do most good. They were given authority to spend 40 per cent of the principal during the first two years and the

rest was to remain intact for 30 years. From the income, gifts might be made at the discretion of the trustees.

At the time of the creation of the fund Mr. Peabody made a confidant only of his close personal friend, Gov. Robert C. Winthrop, of Massachusetts, and the announcement of the establishment of the fund was one of the greatest pieces of news of the times. No other man in America had ever given away, during his life time, a sum anywhere approximating the Peabody Fund.

Mr. Peabody, though he lived long in London, was a lover of his own country. He realized that after the Civil War, certain parts of the South had suffered to such an extent that it would be many years before they would again be financially able to spend much money on education. The South had no public school system, so the Peabody Fund trustees began their work by establishing normal schools for teachers. Later, a great deal was done for rural schools, and, gradually, schools of higher grade were instituted. Maryland, Kentucky, and Missouri did not share in the distribution of the income because they always had good public schools, but it was understood that they too should become beneficiaries in the final distribution of the principal. Colored as well as white institutions have benefited, Hampton and Tuskegee being among the beneficiaries.

The original board of trustees was made up of 15 members, all now deceased. Governor Winthrop was the chairman, and others were Hamilton Fish, of New York, Bishop McIlvaine, of Ohio, Gen. U. S. Grant, William C. Rives, of Virginia, William Aiken, of South Carolina, William M. Evarts, of New York, William A. Graham, of North Carolina, Charles Macalester, of Pennsylvania, George W. Riggs, of Washington, Edward A. Bradford, of Louisiana, George N. Eaton, of Maryland, and George P. Russell, of Massachusetts. Admiral David G. Farragut was afterwards added to this number.

No attempt was made in the direction of dissolving the trust or disbursing any one great sum until 1905 when it was proposed to give \$1,000,000 to the Peabody College of Nashville, Tenn. In the opinion of the trustees at the time, however, that institution was not able to meet the necessary requirements and the money was not given over until 1909, when the George Peabody Normal College took the place of the old Peabody College.

The details of dissolving the fund are now in the hands of a special committee instructed to report during 1911.

Peace Movement. A year of notable achievement in the cause of universal peace closed in Dec. 1910 with the international conference of the American Society for Judicial Settlement of International Disputes, held in Washington, D. C. The day before the conference opened Andrew Carnegie made public his Peace Foundation (q.v.) of \$10,000,000, and the steps which had been taken towards lasting peace were discussed. During the summer an important conference was also held at Lake Mohonk, N. Y., which was attended largely by ministers of the gospel. Bishop Greer, of New York, was chairman. The sense of the conference was that peace required active advo-

PEACE MOVEMENT—PEACE PROGRESS

cacy and the conference took upon itself the duty of spreading the movement.

A movement fraught with greater possibilities for the actual establishing of peace was started at a dinner held in New York by the Canadian Club, 10 Nov. 1910, when it was agreed that some significant event should take place to celebrate the treaty of Ghent which ended the war of 1812, the last conflict with Great Britain. The treaty was signed in 1814, permitting four years before the centenary. It was proposed that it be marked by the opening of a new international bridge across the Niagara River, the expense to be shared equally by the United States, Canada, and Great Britain. Action was taken on the occasion towards the appointment of the proper commissions by the three governments in question.

A significant memorial to mark a peace which has long been established was erected on the Summit of Lookout Mountain, one of the most famous battle scenes of the Civil War. The monument, dedicated to "Peace," was formally presented to the Chickamauga Park Commission by the State of New York, 15 Nov. 1910.

The Hague Palace of Peace is well under way and presents an architectural appearance of unusual beauty. It lies about a mile from The Hague on the grounds upon which formerly stood an old-fashioned Flemish Palace, which will be razed to give the proper landscape effect. The building stands back from the road and is built of brick and stone, with a roof of blue Welsh plates. The architecture is partly Flemish and partly Dutch, and is remindful of old town halls in Belgium. The Palace will be completed in 1913.

A recent contribution towards universal peace was the \$1,000,000 foundation made by Edwin Ginn, of Boston, who has started the International School of Peace and provided it with an annual income of \$50,000 by the terms of his will, in addition to the original foundation. Meanwhile his efforts have been towards eliminating textbooks dealing with war and modifying the studies in schools and colleges by removing as much as possible the usual emphasis laid on the war-like spirit. He further hopes to maintain an organization of men to exert their influence in all the capitals of the world against the present tendency towards increased armaments. He has issued a number of books and pamphlets.

The Peace movement in general, while active, has been chiefly effective through the activities of the various societies in all nations working towards the same end. The increase in this respect is shown from the fact that while from 1840 to 1860 there were only 28 international peace conferences, since that time there have been over 2,000. These have been largely held under the auspices of the smaller organizations. Allied with these are: The Pan-American Union; the International Bureau of the Hague Arbitral Board; the Bureau of the International Sugar Union; the Bureau for the Repression of the Slave Trade at Zanzibar; the International Office of Public Hygiene; the Bureau of the International Postal Union; the various associations mapping the land and charting the seas. All these organizations are subject to the international law, and, on that account, are closely related to the peace movement,

which is largely founded on international law. The hope of perpetual peace is based on a more perfect understanding and administration of the general laws between nations.

Smaller organizations, which have been fostering this are the Permanent International Peace Bureau, with headquarters at Berne, Switzerland; the International Institute of Peace, founded by the former Prince of Monaco; the American Peace Society, which won the Nobel Peace prize of \$38,000 in 1910; the Association for International Conciliation, the American branch of which distributes 50,000 copies of a publication each month; the Bloch Museum of War and Peace in Lucerne, founded by the Russian financier, Jean de Bloch; the Esperantist Society with headquarters at Neuilly-sur-Seine; the World Federation League of New York, besides a great number of lesser societies scattered throughout the civilized world. England alone had many of them, the publication *Concord* representing the English movement.

The International Institute of Peace has published a large volume by Gaston Moch on the general subject of peace in relation to arbitration. This has been followed in America by a book by Edwin D. Mead on the establishing of peace between Great Britain and the United States. This is a part of the general movement in that direction, the practicality of which is based on existing alliances, such as that between Italy and Argentine, Sweden and Norway, and Argentine and Chile, which commemorated the occasion of signing the treaty with a monument on the summit of the Andes.

A similar treaty was under discussion through a pourparler at the close of 1910 between Great Britain and Germany, following a period of distinctly antagonistic feeling between the two nations. The negotiations have been purely diplomatic, but there has been strong pressure in both countries which would cause an understanding whereby all important international disputes could be submitted to The Hague Court (q.v.), the powers of which have grown. Secretary Knox announced through former Ambassador to England, Joseph H. Choate, that he had a plan which would make possible the increasing of the powers of The Hague Tribunal to any desired extent. The announcement made at the international conference of the American Society for the Judicial Settlement of International Dispute marked the culmination of the peace movement at that time. The Orinoco decision, which was handed down by The Hague Tribunal, overruling an international court, established The Hague as the court of final adjudication, and under the new organization plan, will make it a much more powerful body. This will give strength to the peace movement on account of the increased amount of business which is coming before it.

Peace Progress. During 1910 there were notable disputes settled by arbitration which showed correctly the trend of world affairs in the peace movement. The principal disputes settled include those between Peru and Chile, and between Peru and Ecuador, and the danger of a general European war growing out of the troubles of Crete. The acute friction between England and Germany which marked the beginning of the year also passed away

PEANUTS

without open trouble. There was also settled the century-old dispute between the United States and England over the New England fisheries, The Hague Tribunal having reached a conclusion satisfactory to both countries. International conferences are of similar order. There were held the fourth Pan-American conference at Buenos-Aires, the Spitzbergen conference in Christiania, the conference regarding aerial navigation at Paris, and that dealing with international exchange at the Hague. At Brussels was also held a conference on maritime law. There were also two other international events of great importance, the formation of the South African Union and the Russian-Japanese treaty of 4 July. The first gives the Boers an extensive influence in South Africa, and the second defines the rights of the Japanese and Russians more clearly than the Peace of Portsmouth. The disarmament most desired by peace advocates is, however, apparently as far from realization as ever, and all important nations are continuing to arm themselves more rapidly than ever. In this country this is chiefly in the direction of the navy.

Peanuts. The time when the peanut was a product associated inseparably with circus days and school-days has long passed by. Although the peanut is still sold by vendors at every street corner, roasted over a little gas or oil stove, it is becoming a farm crop of great importance throughout the Southern States, and while more peanuts are sold than ever before, tons of the nuts never see the market in their shells.

The peanut is a legume, and as such possesses the curious power of gathering nitrogen from the air and enriching therewith the soil in which it grows. It is, in fact, a pea rather than a nut, but matures its pod underground instead of in the air. Nitrogen in little nodules collects upon the roots of the plant, and scientific farmers are using it more and more in soil-renovating, planting a crop and plowing it in without any attempt to gather the seeds, or planting land with peanuts one year in each three or four, following the peanut crop with rye, then with cow-peas, and then with corn or cotton.

The industry is established throughout the South Atlantic States, as far north as Illinois and as far west as California. The climate required by the peanut is one in which the frost-free season is long, the soil containing a large percentage of sand or alluvial matter, a light rainfall, plenty of sunshine, and a high temperature. It is rather more susceptible to injury from frost than the common bunch bean. The Spanish peanut will mature in from 90 to 120 days; the large-podded varieties need more time.

Soils that are dark, or carry much iron, will stain the shells of the peanuts, but clayey, loamy or lime soils often produce heavier nuts, and the color of the shells does not hurt the crop unless it is to be marketed in the shell. For feeding stock or producing any of the various oils or butters that are now made from the peanut, such a crop would be of value. Lime should be used on land that is planted to peanuts unless it is already abundant in the soil.

Fertilizers adapted to potatoes will suit the peanut. Stable manure is apt to cause the

plant to run to tops and poorly filled pods. The best fertilizer contains 2 to 4 per cent of nitrogen, 5 to 7 per cent of phosphoric acid, and 6 to 10 per cent of potash. Especial care should be taken to choose large, fine nuts, from well-matured plants, for the seed, and also to select seed from plants producing the greatest number of pods. The seed should be shelled when the large-pod varieties are handled. A machine potato digger can be used to dig the peanuts, but there are special machines for the purpose which greatly facilitate the work, and also sever the main root at a point which will leave deposits of nitrogen in the soil, of \$3 to \$4 an acre fertilizing value. Virginia Bunch peanuts are much used for vending purposes, the Spanish, North Carolina, and Tennessee Red will do for the shelled nut industries, or for feeding stock. The shell of the nut is, in large cleaning factories, used as fuel, and the resulting ash is used as a fertilizer; the thin brown covering has a feeding value for stock almost equal to that of wheat bran. The Smithfield ham comes from hogs partly fed on peanuts. An acre of first-class peanuts, calculating the yield at a ton of vines, \$8 to \$10, and 60 bushels of peas, worth \$40 to \$60, gives an income of \$48 to \$70, while the cost of growing is from \$12 to \$25, depending on local conditions and the skill of the farmer.

Peanuts at present form an important ingredient in the vegetarian "meats" which are much more widely consumed than is probably supposed. Some of these "meats" are made in imitation of breaded lamb chops, with sticks of macaroni for bones. Peanuts are employed extensively in the confectionery trade and enter into the composition of many cakes, such as macaroons, for instance, as a substitute for almonds. Peanut butter, likewise, manufactured by the ton and put up in neat packages is in great demand. Peanut butter is put up either in bottles or tins containing quantities ranging all the way from a quarter of a pound to five pounds. For making butter peas are shelled, then roasted moderately, after which they are fanned and screened to insure the removal of the thin inside skins and all germs. The next process consists of grinding them to a pulp by machine. As the pulp comes from the grinder it is fed through a tin tube into bottles or tins, and then tightly sealed. A great quantity of home-made peanut butter is also turned out with the aid of a small meat grinder. Great quantities of peanuts are also employed for making peanut candy and peanut "brittle" while thousands of bushels are annually shelled for use in combination with popcorn and puffed rice and as "blanched" peas.

The value of the 1910 crop of peanuts in the United States was estimated at more than \$12,000,000, yet the number of bushels which this sum represents proved quite inadequate to the demand, and it was found necessary to import large quantities of peanut oil from Europe. It appears probable, however, that in the near future this country will come much nearer supplying its own demand for this healthful little food than it did in 1910. Now that the inroads of the destructive boll weevil have ruined such wide areas of cotton fields in the South, many planters in that section are turning their attention to peanuts as a more profitable crop. Peanuts at present give an

PEARL INDUSTRY — PEARSONS

average yield of 34 bushels to the acre. It is believed, however, by experts of the Department of Agriculture that the output can be increased to 50 or even 60 bushels an acre by selecting superior seed from season to season. There have been record yields of 160 bushels of small podded peanuts to an acre, with two tons of forage, which latter will alone cover the cost of production. However, this of course cannot be considered typical. The peanut supply at present remains in this country far below the constantly increasing demand.

Pearl Industry. Pearls have always been highly prized by those who wear precious stones, and it is believed that the pearl is the most ancient of all the precious stones known to man. The prices of pearls have been steadily increasing, during the past few years; and there seems good reason to suppose that they will continue to increase for some time in the future. This is not due to the fact that the oyster has been less busy depositing pearls; but the gems have been withheld from the market in large numbers, in order to force up the price of these stones. There is a chance, however, that the price will greatly fall; and this for two reasons. In the first place, a method has been discovered by means of which it is possible to raise pearls far more cheaply than heretofore. It is a Japanese discovery, kept a close secret, and known only to a few pearl raisers. If this secret became publicly known, it is possible that pearls would fall 100 per cent below their present value.

The Chinese have a method of stimulating the production of pearls by placing small images of some god in the shell of the oyster, which, in course of time, gets covered with pearl. These are greatly prized by the Chinese, and used by them as household gods.

According to tradition, pearls are the symbol of tears. This idea is not merely poetical, but is based on the process by which they are made. A small parasite finds its way into the oyster or pearl mussel and the creature weeps. These tears are composed largely of lime, which envelops the parasite and eventually forms a pearl. Sometimes the parasite is able to soften the casing and escape, and the rudimentary pearl is crushed and ruined. If, however, the living organism dies, the calcifying process persists, and the pearl continues to grow in size as long as the mussel lives. A medium sized-pearl takes 6 or 7 years to grow in this fashion, but by the end of that period it is a comparatively valuable commercial article. This is the process of the formation of most pearls; some of them are formed around grains of sand, and other irritating substances which have found their way into the pearl; but the vast majority of pearls, when the 'substance' has been dissolved away from them, for the purpose of analysis, disclose the remains of parasites as a nucleus, around which the pearl has formed.

Pearl fishing is carried out by very different methods in various countries. In Ceylon, near Aripo, divers are employed; and this is the usual process in all occidental countries. In Japan, women fish for pearls in a very primitive fashion. They wear simply a white cloth, with glasses to protect the eyes from the salt water. Armed with a bucket which is attached to the waist, they dive down to the oyster beds,

from 5 to 20 fathoms deep, and gather the oysters in the buckets they carry with them. They can remain under water from 1 to 3 minutes. In summer-time, 7 or 8 hours are considered a day's work, in winter, 1 to 2 hours. Special huts are built, with large fires, at which these women can warm themselves when chilled. Hundreds of pearls are gathered in this manner.

The oysters are placed first of all in shallow water, and then a substance or object is placed within the shell, which will cause the oyster to secrete its well-known pearl "tears." For a time they are kept and fed; then, as the winter approaches, the water becomes too cold at the shallow depth at which they have been planted, so they are removed to deeper beds, where they remain for a space of 3 years, or more. As will be seen, pearl-growing is a tedious process.

The phase of this subject which is at present attracting wide attention is the possibility of artificial pearl making. Of late years, this has grown apace; and now thousands of "pearls" are placed upon the market, which cannot be distinguished from the true pearl except by an expert. The process by which these artificial pearls are made is somewhat as follows—though the process necessarily differs in various cases:

Small hollow glass balls are blown, and clever workmen can give them the regular shape of natural pearls. Into these balls is inserted a mixture known as "essence à l'Orient," which is made of scales of white fishes mixed with water, salt, and ammonia. This forms a liquid pap, closely resembling in appearance the real pearl.

No less than 50,000 whitefish are required to obtain a little over 2 pounds of "pearl essence." With the pap, a wax-like material is put into the glass ball by means of a tube, so as to make the pap adhere to the ball. Wax was once used for this purpose, but it was found that pure wax melted too readily, and the compound now used was invented.

The outer covering of these pearls has a faint opalescence, and the sparkling surface of the pap combines to produce a real pearl-like effect.

Pearsons, Daniel Kimball, philanthropist: b. Bradford, Vt., 14 April 1820. He received a public school education and taught school, 1836-41, when he studied medicine in the college at Woodstock, Vt., graduating M.D. 1842. He practiced in Chicopee, Mass., 1842-57, and in the latter year retired, removed to Ogle County, Ill., and became a farmer. In 1860 he went to Chicago and engaged in the real estate business, handling farm lands in Illinois and Iowa and timber lands in Michigan. He also was interested in financial projects with Sol. Smith, Philip Armour, and Daniel A. Jones, and accumulated a vast fortune. In 1887 he retired from active business life, but retained his directorship in the Chicago City Railway Company and other corporations. He devoted his fortune to educational philanthropic work, and made donations aggregating about \$6,000,000 to colleges and charities, chief among which are: the Chicago Theological Seminary, \$280,000; Beloit College, \$600,000; and 45 other colleges are the recipients of large amounts. He is a firm believer in coöperation and requires that

PEARY — PELLAGRA

a larger sum than his endowment be raised from other sources before his donations become available. In 1910 it was estimated that he had succeeded in giving away \$6,000,000.

Peary, Robert E. See NORTH POLAR RESEARCH.

Peat in America. The United States Geological Survey and the Geological Departments of New York and New Jersey called attention during 1910 to the possibility of utilizing the peat deposits of those States for the obtaining of a substitute for coal. It was shown that there were millions of tons of peat fuel within 100 miles of New York worth at least \$3 a ton. Possibilities of heating and lighting the cities in this vicinity from peat were also outlined. The peat in these marsh lands and bogs has accumulated by the gradual decomposition of sphagnum moss and other vegetable growth. Machinery for the manufacture of peat briquettes have been set up at various points along the edges of these marshes. These machines receive the peat in barrels and after it has passed through them it comes out in a thick mass and gradually dries into forms. The best grade of peat produced in this manner can be sold profitably for \$2.50 a ton and has a fuel value as great as the grades of coal costing from \$3 to \$4.50 a ton. Peat deposits are common throughout the United States, many of the Southern States containing large quantities. Peat coke has been on the market in parts of the United States and Canada for several years and the manufacturers have been able to make a profit from the sale. It is predicted that the gradual exhaustion of coal deposits will cause an increasing use of peat. In Canada the Government has encouraged the production of peat and it is better known there now as a fuel than in the United States.

Pellagra. This disease has only been definitely recognized and classified within the past few years. In 1909, 116 deaths occurred, and 23 in 1908, which were attributed to this disease; but none prior to that year, except one in 1904. Before that date, deaths apparently due to this cause were attributed to other diseases, or the cause of the death was stated to be "unknown." It is only within the past three or four years that the disease has been definitely named.

It is generally believed that pellagra was due to corn which had been contaminated by certain micro-organisms. It had become "moldy." Lombroso worked over this problem of curing pellagra for years, and was the man who saved the peasants in northern Italy from this disease, by ascertaining its cause. There, pellagra was extremely common, the peasants dying by the thousand; and Lombroso's work in ascertaining and removing its cause, will always be gratefully remembered by Northern Italians as, perhaps, his most important work, from the humane standpoint.

There is an evident tendency in the Southern States to disbelieve the theory that pellagra is due to moldy corn, however; and many arguments have been advanced, in an effort to show that it cannot be due to this cause—so far with varying success. If beri-beri is due to rice and pellegra to corn it is indeed a difficult matter to select that cereal which is free from objection and danger.

More than 300 cases of pellagra have been shown to exist in the Southern States, while

some estimates run into the thousands. It is probable that these are largely cases of mistaken diagnosis, however. True pellagra generally terminates in a very aggravated form of insanity.

The latest investigations have disclosed the fact that there is a distinct type of bacterium or germ in the blood, in this disease, which is thought to be responsible for it, in much the same way as the sleeping sickness (qv) is due to its specific micro-organism. This being established, the task of finding a serum or antidote for the micro-organism will be necessitated; and, should this be discovered, there is reason to think that this disease, like so many others of a similar nature in the past, will disappear, or, at most, be encountered but rarely and in isolated cases.

Basing his argument upon the common belief that pellagra is caused chiefly, if not entirely, by moldy corn, a recent writer in *Good Health Magazine* suggests that beer made from such corn might be a cause of the infection. He says:

"There is a constant source of pellagra which at the present time seems to have been overlooked,—namely, beer. Most of the beer used in this country is made from corn, and it is quite reasonable to suppose much corn which might not be considered highly suitable for the making of grits or cornmeal might be considered good enough for beer. It is doubtless true that there are at the present time many, or even more people making use of corn in the form of beer than in any other form, and it would be well for such persons to know that in the use of beer they are running greater risk of taking pellagra than would be involved in the ordinary use of corn. In the use of beer, it would be impossible to tell anything about the condition of the corn from which the beer is made; whereas ordinary corn products can be easily inspected. If the discovery of pellagra has the effect to materially lessen the consumption of beer, it may be the means of accomplishing great good in the battle against intemperance."

This idea does not seem to have met with favor from the medical profession, however, and the most recent investigations seem to confirm the idea that the disease is not contracted in the manner suggested at all; but rather because of the bite of a minute sandfly, which is found in great numbers in certain countries—mostly in northern Italy. Further reports are awaited on this question with eagerness by the medical profession.

At the close of the year 1910, a most important and interesting fact was made known by Dr. Fraser B. Gurd, of the University of Tulane. It was that, according to his experiments, the rays of the sun have an appreciable effect in causing or helping to cause this disease. Doctor Gurd asserts that the violet and ultra-violet rays of the sun cause the skin to lose its resistance, and this weakness may result in irritation, discoloration and thickening of the skin, which are the accompaniments, at least, of pellagra. In the *Journal of Experimental Medicine*—the official organ of the Rockefeller Institute—Doctor Gurd presents photographs which show that only the portions of the body exposed to the sun reveal skin lesions peculiar to the disease. The thickening and

PENDULATION — PENNSYLVANIA

discoloring of the integument of the body are seen in pellagra patients, on the hands and wrists below the sleeve; while one man saved a small portion of his finger by wearing a seal ring (The skin is clear and white beneath the circlet of gold and setting) Natives of southern climes who wear little clothing are likely to have wider areas of skin affected. The disease, however, is accompanied by digestive disturbances, and spinal pains; and it is the theory of Doctor Gurd that the nerves which are near the skin may be affected in such a way as to disturb the whole nervous system. He contends that the disease is essentially one of the skin and nervous system. If these theories are proved to be correct, a long step will have been taken toward an understanding of the disease and of its consequent cure.

Pendulation, Earth. See EARTH PENDULATION.

Pennsylvania. One of the States in the Middle Atlantic division, with an area of 45,126 square miles and a population in 1910 of 7,665,111. The capital is Harrisburg.

Agriculture—Market gardening, fruit growing, horticulture and forestry are pursued within the State. The number of farms reported in 1910 was 218,394 as compared with 224,248 in 1900, a decrease of 5,854 or 3 per cent. The total value of farm land and buildings in 1910 was \$1,035,300,000. The reported value of farm implements and machinery was \$70,547,000. The total acreage in 1910 was 18,556,000, the improved acreage amounting to 12,660,000 acres. The average value per acre of land and buildings was \$55.79, the average value per acre of land alone being \$33.80. The expenditure for labor in 1910 reached the sum of \$25,079,000, while the expenditure for fertilizers amounted to \$6,756,000. The crops continue large. In 1909, 26,265,000 bushels of winter wheat from 1,545,000 acres were worth \$28,629,000; 48,800,000 bushels of corn from 1,525,000 acres, \$34,160,000; 25,948,000 bushels of oats from 998,000 acres, \$12,974,000; 23,790,000 bushels of potatoes from 305,000 acres, \$15,464,000; 3,732,000 tons of hay from 3,118,000 acres, \$54,633,000; 5,655,000 bushels of rye from 300,000 acres, \$4,406,000; 5,655,000 bushels of buckwheat from 240,000 acres, \$3,845,000; 30,732,000 pounds of tobacco from 31,200 acres, \$2,765,800.

The farm animals in 1910 numbered 619,000 horses; 43,000 mules, 1,140,000 dairy cows; 907,000 other cattle; 1,112,000 sheep, 931,000 hogs. The wool clipped amounted to 4,936,960 pounds.

Mines and Manufactures—Pennsylvania continues to produce half the total output of coal for the United States. In 1909 it mined 83,268,754 short tons of anthracite, worth \$158,178,849 and 117,179,527 short tons of bituminous coal worth \$118,816,303. The crude petroleum output in the same year was 9,525,325 barrels (42 gallons) worth \$16,881,194. The natural gas was worth \$19,104,944. Iron ore (magnetite and hematite) production amounted to 443,161 long tons and the pig iron 6,987,191 long tons, worth \$111,385,000. The output of granite was worth \$324,241; slate, \$3,902,958; trap rock, \$517,909; marble, \$102,747; limestone, \$1,368,784; Portland cement, \$13,899,807; sand for moulding, \$1,718,703; bricks, etc., \$14,842,982. Coke was produced to the amount of 15,511,634 short tons. In 1905 there were 23,495 established manufactories, involving \$1,995,836,-

988 capital; 763,382 wage earners were employed, receiving in annual wages \$357,960,800. The raw material used was worth \$1,142,942,707. In 1909 the steel industry produced \$363,773,577 worth of output; the foundries produced \$110,650,913 and the textile industries \$118,431,618.

Charities and Corrections—Pennsylvania contains two penitentiaries; one at each end of the State, and several industrial and reformatory schools. Altogether there are 409 benevolent institutions in the State, of which 27 are public. There are 145 hospitals; 94 orphanages, 129 homes for adults and children, 8 for the deaf and blind. Pennsylvania is one of the states that is leading in the movement towards limiting the orphanages and finding permanent or temporary homes for orphans. During the year active support was given by the charitable organizations to the attempts of heirs to break wills donating money to the building of orphanages. Altogether over \$6,000,000 was involved.

Finance—For the fiscal year ending 30 Nov. 1910, the State revenue was \$28,946,424.43. The expenditures during the same period were \$27,657,399.88 leaving a balance on hand of \$1,289,024.55. The assessed valuation of real property was \$5,217,297,255. The assessed valuation of personal property was \$1,184,298,749.46. The bonded debt for the fiscal year ending 30 Nov. 1910, was \$2,250,750.

Government—At the election of 2 Nov. 1910 John K. Tener, the Republican nominee for governor won with a plurality of 412,658, and his nearest opponent was the candidate of the Keystone reform party 382,127. The State Legislature for 1911 is Republican with 38 members in the Senate against 12 Democrats, and 161 in the House of Representatives against 45 Democrats. There is one independent vote in the House. The Senators hold office for four years and the Representatives for two. The governor's salary is \$10,000 a year. Governor Tener holds office until 17 Jan. 1915. The Legislature, which meets biennially, assembled 3 Jan. 1911, and no limit is set upon its deliberations. The next State election will be held 5 Nov. 1912.

Legislation.—Pennsylvania has shown a disposition to adopt progressive legislation. At the session of the Legislature in 1909, laws were passed providing that religious belief should not affect the credibility of witnesses; providing for adult protection; providing that State funds should only be spent in specific amounts for specific purposes. Pure food laws, adequate health regulations and child-labor laws were also enacted.

History, 1910—Pennsylvania was rather seriously hampered by strikes during 1910. The most important strike occurred in the Irwin bituminous coal district where a situation bordering on civil war existed during the greater part of the year. The striking miners were in frequent clashes with the authorities but better order was maintained than in strikes before the Pennsylvania constabulary was organized to meet such emergencies. Difficulty was also experienced at Wilkesbarre where 1,200 strikers on the Delaware and Hudson Railroad, angry at attempts to fill their places, blew up the track with dynamite. Riots over the same difficulty took place in Carbondale. One man was killed

PENNY PROVIDENT BANK — PENSIONS

and many injured. Over 500 shots were fired and many took effect. At Avoca a number of shots were fired at passing trains, but no damage resulted. The Philadelphia and Reading and the Lehigh Valley railroads were convicted of having granted illegal rebates to the Bethlehem Steel Company. The Baltimore and Ohio Railroad was also charged with keeping men on duty for more than 16 consecutive hours.

Penny Provident Bank. An organization, founded 20 years ago on the plan of the penny banks of Europe, in which children may deposit sums however small. The idea originated with Otto T. Bannard and Robert W. de Forest, president of the Organized Charities, and from the United Charities Building, New York, it has spread all over the eastern part of the United States. The Bank has promoted thrift among the children of the poor and it is not accessible to the offspring of the wealthy. Since its establishment it has had 50,000 depositors who have deposited pennies to the sum of more than \$1,500,000 in the 300 penny banking stations in settlement schools and department stores. The University Settlement in New York is the largest of the deposit stations and close to \$100,000 in pennies have been deposited there. The children, according to one connected with it, save their money for all sorts of purposes. One little girl saved \$60 to buy a tombstone for her sister. Another scraped together almost as much for a piano, her father helping her toward the end. An older boy saved for his violin and paid for his lessons regularly through the bank. The pennies and other sums are exchanged for stamps which are pasted in a bank book. If the card is lost or destroyed no money is paid on it, and this teaches the children carefulness. Stamps that have been transferred are questioned, but payment is seldom refused on them. Sometimes a stamp works loose from a book, in which case it is supposed to be brought back and pasted in by aid of the mucilage bottle on the receiving teller's table. The loss of a book usually means the loss of the money. So the children are encouraged as soon as the accounts reach the dignity of dollars to deposit them in a regular savings bank, where they will be safe and will draw interest. Thus the child learns not only the satisfaction of saving, but the relative value of money.

Pensions, Old Age. Although no disposition has been shown to pension all people who have reached old age, individual American companies, chiefly the railroads, have established pension funds for their aged employees, and there is considerable probability that the United States Government will adopt a similar policy towards many of its civil employees who do not benefit from pensions now. England, Germany and Australia give pensions to all old persons, France to those in public and semi-public service. Several American States have adopted long-service retirement laws for civil employees, but no State has industrial old-age pensions. In Germany old age pensions have been in existence now for 40 years. There it takes the form of insurance, which is compulsory for all persons engaged in industrial pursuits receiving less than \$750 a year. In 1908, 748 of each 1,000 were covered by insurance against sickness, accident, invalidity and old

age. The entire system is operated and controlled by the Imperial Insurance Office, and almost half the necessary funds are contributed by the wage earners in the form of premiums. The Government's contribution is little more than half.

The railroad pensions paid in 1909 in this country were \$1,557,079, to 6,254 pensioners. Of the 1,502,000 railroad men in this country, 665,000 were employed at the close of 1910 by railroads which had pension funds. These railroads are, Pennsylvania Railroad, Baltimore & Ohio, Southern Pacific, Chicago & Northwestern, Delaware, Lackawanna & Western, Philadelphia & Reading, Illinois Central, Atchison, Topeka & Santa Fe, Union Pacific, Sunset Central Lines, Atlantic Coast Line, Buffalo, Rochester & Pittsburg, Oregon Railroad and Navigation Company, and Oregon Short Line.

Wilton C. Garrison, chief of the New Jersey State Bureau of Labor Statistics, presented to Governor Fort 31 Dec. 1910 a report on old age pensions as practiced abroad and recommended that laws bringing about similar conditions be passed in New Jersey. State Comptroller Clark William of New York pointed out the need of laws for old and worn-out State employees. Newfoundland adopted an old age pension system during 1910, setting aside \$20,000 to be paid in sums of \$50 each. This will go chiefly to the support of aged fishermen.

A retirement pension for Government employees under civil service was provided for in a bill introduced in the House of Representatives 21 Dec. 1910. The retirement pension, according to this bill, was based on the average annual pay of the employees for the five years preceding retirement. If this should become a law, after thirty years of civil service clerks could retire at the age of 60 with 50 per cent of their annual pay; after 25 to 30 years, retirement at 62 would include 45 per cent of their pay, and 20 to 25 years would enable retirement at 65 with forty per cent of their pay.

Effort was also made by shipping-men towards the close of 1910 to secure retiring pensions for life-savers. Their average pay is \$5 a month and old life-savers now frequently end their lives in almshouses. During the fiscal year ending 30 June 1910 \$13,000,000 in property was saved by life savers. The increased cost of pensioning them would cost \$415,000 a year.

Pensions, United States. The pension roll of the Government at the close of the past year showed a decrease in the number of pensioners of slightly more than 25,000 names. The total of the pension roll for the year amounted to \$158,232,391, a decrease from the previous year of \$2,350,478. There still remains on the pension roll 921,083 wards of the Government despite the fact that during the year 51,000 pensioners died, and nearly 3,000 more were stricken from the list for other reasons. During the period 29,000 persons were added to the rolls. The number of survivors of the Civil War on the pension roll at the close of the year was 562,615, a net reduction during the year of 31,345. The total number of survivors whose names were dropped from the roll on account of death was 35,312. The total number of soldiers and sailors of all the wars drawing pensions at the close of the year was 602,180 and the number of widows and dependents was 318,461. There is a daughter of the Revolu-



JOHN K. TENER,
GOVERNOR OF PENNSYLVANIA.

PENTECOSTAL CHURCH OF THE NAZARENE—PERKINS

tionary War still on the roll. There are 338 widows of the War of 1812, 1,500 survivors and 2,822 widows of the Indian Wars; 2,042 survivors and 6,395 widows of the Mexican War, and 22,792 survivors of the Spanish-American War. Also there are 13,180 invalids of the regular army and navy drawing pensions. Since the foundation of the government and including the last fiscal year a grand total of \$4,073,056,-569.81 have been paid out in pensions, which is a sum larger than the national debt.

Pentecostal Church of the Nazarene. This is one of the newer evangelical denominations, and is the outgrowth of a number of small, isolated and widely separated beginnings. The denomination numbered at its last General Assembly held in 1908, 10,413 members with about 450 ministers and evangelists. The distinctive feature of the movement is an emphasis upon the Wesleyan doctrine of entire sanctification, which was a prime doctrinal feature of the early Methodists. Theologically the Pentecostal Church of the Nazarene is practically identical with the Methodist Churches in America and the Wesleyan and Methodist denominations in England. The church polity is a combination of the episcopal and congregational forms. The individual congregations hold much the same powers as in the Congregational churches, but there is a general oversight of the work by general superintendents, of which there are 3, and district superintendents, of which there are 18.

In 1896 the Association of Pentecostal Churches of America, a small group of churches and missions located chiefly in Brooklyn, N. Y., under the leadership of William Howard Hoople, opened communications with a similar group which had been formed in New England some years previously, under the name of the Central Evangelical Holiness Association. Mr. Hoople had received ordination at the hands of a number of clergymen of other denominations. Mr. Charles BeVier and others were subsequently ordained. The leaders of the New England group were Rev. C. H. Davis, Rev. F. A. Hillary, Rev. W. C. Ryder, and Rev. F. L. Sprague. The result of these communications was a union of the two groups in which the name of the Association of Pentecostal Churches of America was adopted. The articles of faith and the rules previously adopted by the Pentecostal churches were accepted with unimportant modifications and amendments.

In 1907 a union was effected at Chicago with a group of churches organized on the Pacific coast under the leadership of Rev. Phineas F. Bresee and bearing the name of the Church of the Nazarene. The united bodies adopted the name Pentecostal Church of the Nazarene, and elected Rev. Phineas F. Bresee and Rev. H. F. Reynolds to the office of general superintendent.

At the second General Assembly of the denomination, held at Pilot Point, Texas, in 1908, a further union was effected with a group of churches of like spirit and purpose which had been formed in the Southern States, with the designation, the Holiness Church of Christ. The Southern group accepted the name already chosen by the eastern and western branches, and Rev. E. P. Ellyson, of Peniel, Texas, was elected general superintendent.

The denomination supports a number of

missionaries on the foreign field and is represented by three denominational weekly publications, the *Beulah Christian*, the *Nazarene Messenger*, and the *Holiness Evangel*.

Pentecostal Union Church, also called "Holy Jumpers" and "Pillars of Fire." A body of religious enthusiasts, claiming 20,000 adherents. The headquarters of the sect, to which public attention was called in Dec. 1910, by the refusal of the immigration authorities to admit Lillian Allen, a young British adherent, are at Bound Brook, N. J. Mrs. Alma White, the founder, became convinced 20 years ago that the Methodist Church, of which she was a member, had deteriorated from the strict way in which it had been started by the Wesleys. The Pillars of Fire have two doctrines, conversion and sanctification. The sect works fiercely to do away with "drifting with the world" meaning dancing, theatre-going, smoking, drinking, and card-playing. In their methods of worshipping they are in the habit of working themselves up to a state of religious frenzy which calls for groans, and dancing and laughing and shouts to give it vent. The community at Bound Brook is what might be called the Theological Seminary of the creed. They are to fit themselves to be missionaries. But they also work the farm which is 70 acres in area; they compose, print, and mail numberless tracts, occasional books, and two regular weekly papers with an average circulation of 17,000; they do all their own cleaning, cooking, and laundry; they conduct a chapel to which outsiders are invited, and they hold kindergarten lessons for the little children of their members. The affairs of the church are managed by seven trustees, elected for a limited number of years, with Mrs. Alma White at their head.

People's Bank. See BANK, CO-OPERATIVE, THE.

Percy, LeRoy, United States Senator: b. Washington county, Miss., 9 Nov. 1861, son of Col. William A. Percy, an officer in the Confederate army during the Civil War, who was one of the committee of impeachment, which removed Adelbert Ames from the Governorship of Mississippi. He was graduated from the University of the South A. B. 1879 and from the University of Virginia, LL. B. 1881. He was admitted to the bar in 1881 and established himself in practice in Greenville, Miss. He was attorney for many of the large corporations of the South and was a planter of considerable wealth owning extensive land interests. On 22 Feb. 1909 he was elected United States Senator from Mississippi to fill the vacancy caused by the death of A. J. McLaren, defeating Gov. James K. Vardman for that office.

Perkins, George Walbridge, American economist and financier: b. Chicago, Ill., 31 Jan. 1862. He attended the public schools of Chicago and entered the Chicago office of the New York Life Insurance Company as a clerk in 1877 at \$25 per month, rising successively to the positions of bookkeeper and cashier 1881; inspector of agencies 1885; superintendent of the Western Department 1889; third vice-president in 1892; second vice-president in 1898; chairman of the finance committee in 1900, and vice-president in 1903 at a salary of \$75,000. His training in the insurance business caused him to become interested in financial combina-

PERRAULT MONUMENT — PERRY CENTENARY

tions and he was one of the organizers of the Shipping Trust at which time he met J. Pierpont Morgan, and on 1 Jan 1901 he became associated as a partner in the banking firm of J. P. Morgan & Co. He interested himself in solving the economic and industrial problems that had been created by big combinations of capital and delivered addresses at Columbia and Harvard universities on the subject of corporations, suggesting as a remedy for the present abuse by large combinations, National control of corporations, accompanied by publicity. It was through his activity that a number of the railroad and industrial corporations under the Morgan influence were placed on a profit-sharing basis. Mr. Perkins is a director of the United States Steel Corporation, the International Mercantile Marine Company; National City Bank; Bankers Trust Company; vice-president of the Great Central Dock Company; and a trustee of the New York Trust Company and of Vassar College. His railroad interests are very extensive, including the presidency of the Toledo Railway and Terminal Company, and he is chairman of the Cincinnati, Hamilton & Dayton Railway, the Chicago, Burlington & Quincy Railway Company, and a director of the Northern Pacific Railway, and of the Dayton and Union Railroad Company. On 1 Jan. 1911 he severed his connection with J. P. Morgan & Co, retiring from the firm at the age of 49, the possessor of one of the greatest fortunes of the country and devoted himself to corporate work and to the extension of the profit-sharing principle among corporations, which required more time and attention than it was possible for him to give, while remaining with the firm. He has already succeeded in applying this principle to the United States Steel Corporation and to the International Harvester Company, two of the greatest of the modern manufacturing corporations, and the result has demonstrated its success. Labor troubles have been lessened and the condition of the workman improved in each by this method of giving the laborer a greater share of the fruit of his toil.

Perrault Monument. A monument to the famous French writer of fairy tales, Perrault, has been erected in that part of the Tuileries Gardens known as the Terrace of the Organerie, where, by his intervention with the royal authorities a little over 200 years ago, children were for the first time permitted to play. Perrault's versions of traditional nursery fiction have even a greater hold on the imagination of the French than those of Mother Goose on American children. This fact is due to their greater literary excellence. The statue which has been executed by Gabriel Pech, represents Puss-in-Boots directing a group of little ones at a round game. In the midst of them will rise the bust of the author of 'Hop o' My Thumb' and 'Cinderella.' The site chosen for the monument is appropriate for it is still the favorite playground of the children of the Tuileries quarter and overlooking another of their loved resorts, the Champs Elysees.

Perry Centenary. During October 1910 the United States concluded arrangements for the most ambitious centenary of a purely historical nature which has ever been held in this country, the occasion of which will be the one hundredth

anniversary of Commodore Oliver Hazard Perry's battle of Lake Erie. Eight States bordering on the Great Lakes and two others which for particular reasons claim special interest will bear a share in the celebration, and, of course, the Federal government will have an important part in the events of the occasion. Appropriations aggregating considerably more than \$500,000 have been secured for the purpose from the various State legislatures and from Congress. Part of this sum will be used to defray the expenses of the numerous gigantic military and naval pageants which it is planned to have continue throughout the summer of 1913 at Put-in Bay, Lake Erie, which was the scene of the historic engagement with which Perry's name is so conspicuously linked, and will therefore be the headquarters of the centennial observances. The residue of these appropriations will be devoted to the erection of a large memorial shaft to Commodore Perry which will be located on Middle Bass Island, where Put-in Bay is situated, and to the raising and restoration of Commodore Perry's flagship, the *Niagara*, which has been sunk in the harbor of Erie, Pa., ever since the War of 1812. The ceremonies connected with this will be among the most impressive ever held in connection with any celebration in the United States, and following them the ship will be fully equipped exactly as it was prior to its sinking, and put on permanent exhibition at some place, probably a navy yard, which will be decided upon later. The celebration will begin at Put-in Bay on 1 July 1913 and will continue until the close of the summer. The programme, of which the details are now being worked out, will be as follows:

The raising and restoration of Commodore Perry's flagship. The faithful reproduction of the other vessels engaged in the encounter, and the reenactment of the Battle of Lake Erie by members of the United States navy during each day of the celebration. Flotillas of modern warships brought into the Great Lakes for the purpose of comparison with those of a century ago. Encampments and exhibition drills of militia from the ten States participating in the celebration. Exhibition drills of Federal troops. Regatta and parade of the merchant marine of the Great Lakes thus bringing together the largest number of vessels floating the American flag which have ever been assembled simultaneously at one place. Meetings at Put-in Bay of world congresses of all descriptions and conventions of the principal historic and patriotic societies of America. Dedication of a memorial building and shaft to Commodore Perry which will ultimately be turned over to the War Department and used to house all the government stations now in the vicinity and will be capable of receiving wireless messages from any point on the Great Lakes.

The various participating States have all appointed commissions to devise special features of the celebration which each will contribute, in addition to these already scheduled events. The States which will take part in the centennial are: Ohio, Wisconsin, Michigan, New York, Pennsylvania, and Illinois, for the lake States, together with Rhode Island, because of the fact that that was Perry's home State, and Kentucky, because it furnished the bulk of the soldiers who, fighting under Gen. William

Henry Harrison, invaded Canada and, in the Battle of the Thames, made good on land the victory which Perry had won at sea. Of these States, Ohio heads the list in point of funds subscribed, the legislature of that State having appropriated \$80,000 for celebration expenses. The celebration commissions of these various States have organized themselves into a body called the Interstate Board of Perry Victory Centennial Commissioners, of which George W. Worthington, of Cleveland, Ohio, is president, and Col. Henry Watterson, of Kentucky, first vice-president. It is this committee, working as a unit, which has arranged the programme already decided upon. In addition to the individual State appropriations, Congress has voted a fund of \$250,000 toward the celebration.

Put-in Bay, off the island of the same name, is almost in the exact middle of Lake Erie and is a spot which has been long popular as a summer resort and site for the holding of conventions, and it becomes particularly appropriate as the place for the holding of this centenary in that it was close to the shores of Put-in Island that Commodore Perry struck the blow which paralyzed the British naval power on the Great Lakes.

Perry, James De Wolf, fourth P. E. bishop of Rhode Island: b. Germantown, Pa., 3 Oct. 1871. He graduated from the Germantown Academy in 1887 and from the University of Pennsylvania A.B. 1891, and took a post-graduate course at Harvard University, receiving his bachelor degree from that institution in 1892. He entered the Episcopal Theological School, Cambridge, Mass., in 1892, receiving the degree of S.T.D. in 1895. The same year he was ordered deacon and one year later was ordained to the priesthood. He was assistant rector at Christ Church, Springfield, Mass., 1895-97; rector of Christ Church, Fitchburg, Mass., 1897-1904 and of St. Paul's Church, Forbes Memorial Chapel of the Epiphany, and the Church of the Ascension, New Haven, Conn. St. Paul's, one of the leading churches of New Haven, was a most important parish, as it is situated in a neighborhood populated almost entirely by foreigners, and Doctor Perry took up the work of the church as successor to the Rev. Dr. Edwin Stevens Lines, who had been rector for 24 years and who was subsequently elevated to the bishopric of the diocese of Newark. Dr. Perry laid the foundation for a great cosmopolitan work in the parish, was especially active in the Sunday school work of the diocese among the foreign element and took a firm stand for the regulation of saloons in the line of social betterment. At the outbreak of the Spanish American War he served as chaplain of the Sixth Massachusetts regiment of Volunteer Infantry and served from 1898 till 1904. In Nov. 1909 he was offered the rectorship of Grace Church, Providence, R. I., to succeed Doctor Rousmanerie, but declined the call. In 1910 he was elected, and, on 6 Jan. 1911, consecrated bishop of Rhode Island at St. John's Church, Providence, R. I., the Rt. Rev. Bishops Tuttle, Nelson, and Lines officiating, the presentors being the Rt. Rev. Bishops Greer and Brewster and the consecration sermon being preached, by the Rt. Rev. Bishop Lawrence.

Persia. Persia is a monarchy in the western part of Asia, bordering on the Persian Gulf and the Caspian Sea. Its recent history has

depended largely upon its importance in the relations between Russia and England with regard to their Asiatic possessions.

Area and Population.—The area of Persia has been estimated at 628,000 square miles, a large part of which territory is absolute desert. The population is estimated at about 9,500,000, of which a large proportion is nomadic. The number of Europeans residing in Persia is not more than 1,200, and the population does not exceed on an average, 15 to the square mile.

The largest cities are Teheran, with a population of 280,000; Tabriz, 200,000; Ispahan, 80,000; Meshed, 60,000; Kerman, 60,000; Yazd, 45,000, and Barfurush, Shiraz, Hamadan, Kazvin, Kom, Kashan, and Resht, with 50,000 or less, down to 30,000. The nomadic population includes approximately 260,000 Arabs, 720,000 Turks, 675,000 Kurds and Leks, 20,700 Baluchis and Gypsies and 234,000 Lurs.

Government.—Until 1906 the form of government of Persia resembled that of Turkey, the Shah being an absolute ruler and regarded as vice-regent of the Prophet. In Jan. 1906, the Shah gave his consent to the establishment of a National Council. Sultan Ahmad Shah, born 20 Jan. 1898, succeeded his father, Mohammad Ala Shah, who abdicated 16 July 1909, the regent is Ali Reza Khan, Azud el Mulk, chief of the Kajar tribe. The royal family is very numerous, there being some thousands of princes and princesses, but the official yearbook mentions only about 100. The present sovereign is the seventh of the dynasty of the Kajars, dating from 1794. According to the constitution, the Shah must belong to the Shrah faith, and his successor must be his eldest son or the next male heir in succession, whose mother was a Kajar princess.

The National Council consists of and is elected by members of the reigning dynasty, clergy, chiefs, nobles, landowners, merchants and tradesmen. The first Parliament was dissolved 23 June 1908, the building partly demolished and sacked by military, and decrees were issued announcing the abolition of the Council. The Shah in June 1909 re-confirmed the constitution of 1906. On November 15 the new Parliament was opened, but only 67 members out of a possible 200 were present, and there seems no desire to elect the Senate of 60 members provided for by the constitution. The country is divided into 33 provinces governed by governor-generals directly responsible to the central government. By agreement, the "British sphere" in Persia consists of 137,000 square miles with a net revenue of \$250,000, the Russian sphere of 305,000 square miles with a net revenue of \$1,525,000 and about 10 times the population, and the remaining territory is neutral. The spheres include those provinces bordering on British and Russian territory respectively, and the two Powers bound themselves (31 Aug. 1907) to respect the integrity and independence of Persia.

Finance.—The revenue of Persia is affected by variations in the value of silver. That of 1907-08 was estimated at about \$30,000,000. The Foreign Office costs about 2,000,000 krans, but there are no data of other expenditures. Most of the burden of taxation lies on the laboring classes, and more than half the taxes are raised by assessments upon towns, villages and districts.

PERSIA

Army—See *ARMIES OF THE WORLD*.

Navy—See *NAVIES OF THE WORLD*.

Education and Religion—The bulk of the population learns only to read the Koran. A political college, Medresseh i Siasi, was opened in 1900 to prepare candidates for service in the Foreign Office, and now has about 30 pupils. Private tutors are employed by all well-to-do families. There are many medresseh, or colleges, where students are instructed in religion and in Persian and Arabic literature; there is a polytechnic school with a number of European professors, which was opened at Teheran in 1849, and there are French and German schools and military colleges. About 8,000,000 of the people are Mohammedans of the Shi'ah sect, and 800,000 belong to the Sunni sect; there are 9,000 Parsis (Guebres), 35,000 Jews, 45,000 Armenians, and 25,000 Nestorians. There is a general tolerance of all religions in the cities.

Agriculture—The products of Persia comprise wheat, barley, rice, fruits, gums, drugs, wool, cotton, and a great quantity of silk. Opium is also produced and the production of tragacanth and other gums is increasing. Tea plantations were started in the province of Gilan in 1901, but the result was unsatisfactory. Wool is grown both for domestic use and export, and the wool of Khorassan is the best. There is a quality in the wool grown in certain districts which seems to be indigenous and cannot be duplicated elsewhere even with sheep of the same breed.

Exports and Imports—The principal imports are as follows: cottons, sugar, gold and silver, petroleum, tea, cotton yarn, flour, woollens, indigo and cochineal, haberdasheries, rice, and spices.

The exports are: fruits, woollen carpets, raw cotton, fish, rice, gold and silver coined, gums, opium, wool, silk in cocoons, skins, live animals, and silk stuffs.

Manufactures and Minerals—A strong effort has been made by the Persian Government to prevent the importation of cheap aniline dyes into Persia, as this means not only the ruin of the genuine Persian carpet, but the loss of valuable secrets in the making of vegetable dyes, now known to only a few isolated persons. These permanent and exquisite dyes will be crowded out of the market if the cheaper commercial substitutes gain ground, and once lost, they cannot be regained. Persian carpets are all made by hand.

The mineral deposits are considerable, but have not been developed on a large scale. Mines of lead and copper exist in nearly all the provinces, some of the lead ores being argentiferous. Turquoise mines exist near Nishapur. Salt pits are abundant. Other minerals are tin near Azerbaijan, antimony, nickel, cobalt near Yezd, zinc near Teheran, rich iron ore in several places, manganese and borax near Kerman, and naphtha in the west. Distance from markets and want of good roads are the chief obstacles to the profitable working of these mines, most of which have been worked from ancient times.

Communications—There are practically no railways, and no steamers, in Persia, and not many carriageable roads. There is a telegraph system with 6,312 miles of line and 131 stations. There are 144 postoffices, the first regular postal system having been established in 1877. Belgian, Russian, and English agencies are

mainly responsible for whatever improvements have been made in the communications.

History, 1910.—The most recent development in the affairs of Persia is one which has been under consideration at intervals for several years, namely, a trans-Persian railway. Such a railway, properly built and managed, would bring London within seven or eight days' journey of Bombay, with a cost of \$200 railway fare, as against \$300 by the present London-Brindisi route, which requires 14 days. The system would be modelled on the Trans-Siberian and Trans-American lines, and could only be successfully established by the cooperation of financial and commercial representatives of all the nations interested, the leading powers to be Russia and England. M Zvegintzeff, a member of the Russian Duma, belongs to the group formed of the Russian promoters of the plan, and in Dec 1910, was in London discussing the matter with English capitalists. He represents some of the largest banking, railway, and commercial interests in Russia. The line proposed would extend from Baku, the southernmost station on the Russian railway system, direct through Persia, via Seistan, to Nushki on the Anglo-Indian system. There would be branches to the Persian Gulf and to Teheran, unless the main line should go through the Persian capital. Anxiety is expressed that the line shall not have a political character, or be influenced by local political conditions, and to this end it is held desirable to operate it as a whole. While Russia and England would have leading interests, French, German, Belgian, and other nations desiring to invest would be cordially welcomed and treated. This scheme does not interfere with the Bagdad railway, already under construction, and likely to be finished in about eight years, when it is hoped it may profitably effect a junction with the international line. The length of the latter would be about 1,600 miles, and a rough survey has been made, leading to the conclusion that the cost would be about \$90,000,000; the necessary rate of interest for four years, the estimated period of construction, would bring this sum up to about \$102,000,000. From the financial point of view, it is hoped that the possibility of taking passengers and mail from London to Bombay by the shorter route would warrant the construction of the road, even from the first. At present English traffic, for the purpose of saving four and a half days, maintains a special service from Calais to Brindisi, and this would mean a considerably greater saving than that. It seems probable that Persia will not long remain a country with only one railway 10 miles in length.

Politically, Persia is inclined to be suspicious of the attitude of European powers, and to see in any entrance of English or Russian forces into the country, an insidious attempt to dismember the kingdom, the more so as the present Shah is yet a child. The former regent, Azad-el-Mulk, died in 1910, and Nasir-el-Mulk, former premier and minister of finance, was elected by the national council as his successor. A force of English marines, landing at Lingah in Laristan, on the Persian Gulf, was attacked by the Persians, and a pitched battle resulted. It is said that the Persian diplomats have appealed to France and Germany for protection, and any overt action on the part of England or Russia would probably be followed by a formal

protest from the other Powers. Mining and other concessions have been vouchsafed by Persia on condition of the withdrawal of troops. This general state of distrust of the intentions of foreign governments may cause some sporadic disturbances attendant to the building of the railway, should that be undertaken, but it is unlikely that they will be serious. The Persian government has taken some trouble to maintain road guards and otherwise increase the security of life and property, especially in the south. The riot in which the Jewish quarters of Teheran were sacked, in November 1910, 11 Jews being killed and some thousands left homeless, was religious or racial rather than political (like the similar riots in Russia). A military mutiny occurred in August, in Teheran, but was soon suppressed. The new cabinet, formed in July, has announced its intention of strengthening the army and police departments, promoting order, reforming the courts, improving education and employing, in certain offices, foreign advisers. This course, if successfully and persistently pursued, will tend to peaceful establishment of the railway and other interior improvements by the aid of foreign capital, and the consequent enrichment of the country and development of its resources.

Persian distrust of Russian and English influences in Persia is clearly shown in a communication received in Jan 1911 by H. H. Topakyan, Consul-General of that country in the United States, and sent likewise to all the representatives of the government in foreign countries. In it the revolutionary movement in Persia is briefly described, and an appeal made for the sympathy of civilized nations in this effort to maintain a constitutional monarchy. It is claimed that both England and Russia are threatening the independence of the country, and that they have prevented other countries from taking steps to relieve the financial crisis which was a natural sequence of the revolution. It is pointed out also that the lives of foreigners have not been endangered by any of the disturbances in Persia. Germany has also taken a hand in the matter, German diplomats representing that the attitude of England and Russia is a matter of concern to Germany, which demands the open door in that country, particularly regarding railroads. An Anglo-Russian note was, it is stated, addressed to Persia warning that country not to grant strategic railroad concessions to a third power, or to negotiate a loan with one. Germany is seeking there, as elsewhere, investment for capital and commercial contracts, and is not disposed to yield the territory to a combination of English and Russian interests if they can be avoided.

Personality, Multiple, Dual, Etc. It is only within the past few years that a scientific study of dissociated mental states has been rendered possible, and this has been due to the progress in abnormal psychology and psychical research. Before this, these states had been considered "oddities" of the mind, or cases of "spirit possession." Such alternating mental states are now, however, receiving careful analysis and treatment; and there is every indication that they will be fully understood before many years have passed.

The fundamental tenet of the modern theory is that the mind is an aggregate, so to speak,

instead of a unit; it is an achievement rather than an innate gift or possession. As such, it can be dissociated or dissolved into its primary elements. The older psychologists regarded the mind as a thing indivisible; the modern theory contends that it is a "bundle," as it were, and that when the "binding" is removed, the tendency is to disintegrate and go to pieces. The mind is like a cable, composed of many strands. It can thus be seen that a mind divested of its covering would tend very easily to disintegrate or dissociate.

That which tends to dissociate the mind (rupture the "enveloping sheath") is usually in the form of an emotional shock of some kind. Groups of thoughts tend to become associated in the subconscious mind, forming "complexes" (See ABNORMAL PSYCHOLOGY), and these rise to the surface and manifest themselves as varied personalities. It is doubtless in this manner that many cases of split and multiple personality arise.

The most important case of recent years is, probably, that of Dr. Morton Prince, which he has described in his book, 'The Dissociation of a Personality.' In this case, a number of distinct personalities were developed, some spontaneously, some by means of hypnotism; and all of these were studied by Doctor Prince with great care. Their relation to each other; their dreams, etc., were all analyzed. By means of hypnotism, much of value was ascertained concerning the mental life of these "selves;" and an *autobiography of a subconscious self* was actually obtained. Finally, as the result of years of study and experiment, a synthesis was effected by welding together two of these selves or states, and the original woman was obtained.

Another important case was that studied by Prof. Th. Flournoy, of the University of Geneva, upon which he based his book, 'From India to the Planet Mars.' In this case, the form was spiritistic; the various "selves" claiming to be the same woman in previous incarnations. She was successively a Hindu Princess, Marie Antoinette, a personality upon the planet Mars, and a distinct personality calling himself Leopold. These four interchanged at irregular intervals. By means of keen psychological analysis, Professor Flournoy was enabled to trace the factors at work, and to show the growth of the various personalities upon purely psychological lines.

A third case of much importance is 'The Hanna Case,' discussed by Sidis and Goodhart in their book, 'Multiple Personality.' In this case, also, a psychological analysis was made of the various selves and their inter-relations; and the real self was finally recovered by means of hypnotic synthesis.

A fourth case of importance is that reported by Dr. Albert Wilson, in the *Proceedings of the S. P. R.* (Vol. XVIII, pp 352-415). This was the case of "Mary Barnes." She developed no less than ten distinct personalities. The disintegration began with an illness. In this case, the recovery was slow, and was not due to hypnotic suggestion, but rather took the form of a convalescence.

Peru. A Republic in eastern South America, with a coast line 1,300 miles in length. Ecuador and Colombia form the northern boundary, Brazil and Bolivia the eastern, and Chile and Bolivia the southern. Considerable provincial

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territory to the south is neutral until Chile and Peru reach a land settlement

Area and Population.—The total area of Peru is usually estimated (owing to the uncertainty of the Republic's territorial claims) at about 500,000 square miles, and the population is put at 4,500,000. There are fairly accurate statistics for some of the municipalities, as follows (1908): Lima, the capital, 140,900 inhabitants; Callao, 32,000; Arequipa, 35,000 or over; Cuzco, 25,000; Iquitos, 20,000; Ayacucho, 14,350; and Huara, 7,650 inhabitants

Government and History.—The President of the Republic and his cabinet of six ministers; viz., of the Interior, War and Marine, Foreign Affairs, Justice, Religion and Education, and Finance and Public Works, constitute the executive authority of the Government. The President is assisted by two Vice-Presidents; they are popularly elected, and directly, for four-year terms of office. The Legislature consists of two Houses. There are 51 members in the Senate, and 116 members in the House of Representatives (besides substitutes), one-third retiring every two years. Scientific professions or stipulated incomes will qualify electors for positions in either House, providing, of course, the people assent. Senators to the number of four, as a maximum, may originate in a single department. Deputies are representatives of from 15,000 to 30,000 inhabitants each. Local government is administered by Prefects over the departments; Sub-Prefects under them for the provinces; and minor officials finally for the 800 districts into which the provinces are subdivided

Finance.—The receipts of the Government amounted in 1909 to \$15,236,900, and the expenditure to \$16,199,935. The revenue accrued, for the most part, as follows: from customs, \$7,250,000 (approximately); taxes, \$4,750,000; salt monopoly, \$900,000; posts and telegraphs, \$545,000; etc. The principal items of expenditure were: the Interior, \$2,420,000; finance and commerce, \$2,020,000; justice and education, \$2,270,000; war and marine, etc., \$4,400,000; and foreign affairs, \$280,000. The dues from alcohol, opium, tobacco, and stamps are considerable, as are also the proceeds from the Government monopoly on salt; the customs are collected by a company. The revenue for 1910 was estimated at about \$13,388,000. The external debt of the Republic amounts to about \$15,700,000, and the internal to about \$13,500,000, about \$2,350,000 of which is not interest-bearing; rate of interest 1 per cent. The four leading banks in the country are the Bank of Peru and London (capital, \$2,500,000), the Italian Bank, the International Bank of Peru, and the Popular Bank. These and other commercial banks showed an aggregate capital and reserve fund of about \$8,555,000, in 1909. A Savings Bank has deposits amounting to \$1,000,000. The "libra" and the English pound (of equivalent values) are legal tender, as is silver up to \$50. There is no paper money, and very little commercial paper of any kind, in circulation. The French metric system is coming into general use in Peru.

Justice, Education, and Religion.—The Supreme Court at the capital, with 11 judges Superior and Minor Courts also at Lima and eight District Courts in the Republic, have the administration of justice. The judicial officials

are elected by Congress. The Government supports education, which is nominally compulsory for children. The 1907 grant amounted to about \$360,000. The municipalities keep up a large number of free elementary schools. In the middle of 1907 there were 2,400 primary schools, with over 3,000 teachers and 156,000 pupils. There are high schools in Peru, government-supported and practically free. Lima is quite an educational centre. There are in that city a university with various faculties, including literature and political science, a mining and engineering school; an agricultural institute; and a school of arts. There are universities in other cities; private high schools; and a military and a naval school. There are a few Protestant churches and schools in the Republic and Protestants are being tolerated more than of yore; but Roman Catholicism is universally prevalent, and is the State religion, prohibitively so.

Industries.—The agricultural products of Peru are various and plentiful. Coffee is one of the most valuable crops. Sugar and cotton are widely cultivated. There are approximately 200,000 acres of land under sugar. The cocoa output in 1907 amounted to 3,300 tons. The yearly production of rice is about 30,000 tons. Tobacco, wheat, olives, ramie, and maize are grown, and wine is produced. Silk is being experimented with. Rubber is found in plenty. The livestock of the country includes a great number of sheep, alpacas, and llamas. Wool cut in 1907 weighed 4,200 tons; the hides and skins in that year weighed 3,350 tons. The minerals of the country are about as follows: gold, silver, copper, lead, zinc, nickel, iron, quicksilver, cobalt, bismuth, molybdenum, vanadium, borax, coal, salt, sulphur, oil, and earths. The output of gold and silver in 1908 was valued at about \$3,823,000; the total mineral wealth realized the previous year was about \$15,253,000. The mining industry is chiefly in the hands of American, English, and French companies. Manufactures and houses of industry in Peru include rice mills, cocaine works, and cotton factories. The latter produce each year about 15,000,000 yards of cloth.

Trade and Shipping.—The leading imports into Peru are: minerals and metals,—to the value of about \$5,750,000 in 1907; cottons, \$3,255,000; machinery, \$1,455,000; woollens, \$1,295,000; coal, \$1,240,000; wheat, \$1,200,000; timber, etc., \$1,040,000; earthenware and stone, \$930,000; drugs, etc., \$775,000. The various exports for 1907 and their relative values were about as follows: metals and minerals, \$10,015,000; gums, etc., \$4,770,000; sugar, \$4,135,000; cotton, \$2,580,000; wool, \$2,140,000; guano, \$1,960,000; leather goods, \$620,000; and cocaine, \$330,000. The value of \$8,170,000 in Peruvian imports for 1907 came from Great Britain; \$5,920,000 from United States; \$4,465,000 from Germany; \$1,455,000 from France; \$1,210,000 from Chile; and \$905,000 from Italy. United States provided a market for exports from Peru in 1907 worth about \$6,835,000. Chile was the next in order in the export trade; then France, Germany, Great Britain, and Italy. The total value of Peruvian imports for 1909 was about \$26,000,000, and the exports about \$26,500,000. The Republic owns 7 steamers and 60 sailing vessels. The ships of a dozen steamship companies visit at the ports of Peru, which registered about 650 vessels in 1909, of approximately 1,300,000 tons.

Roads and Railroads, Posts, and Telegraphs. There is one good road, about 100 miles in length, but the country is in sore need of better highways. The Peruvian Corporation (a powerful company with powerful privileges) is engaged in the work of railway construction, and other public works. The company controls about 850 miles of the 1,500 miles (approximately) of railway line in the Republic. There is a tramway out of the capital. Postal communications handled in the 620 postoffices in the country in 1908 numbered about 22,353,750. In the telegraph system of Peru the Corporation is again in evidence. It controls 1,180 miles of the 5,986 miles (1910) of lines. There are 3,000 miles of telephone line, cables establishing communication with Republics to the north and south, and a wireless telegraph line to various parts of Peru.

History, 1910 — Peru is likely to increase in importance in the near future through the opening of the Panama Canal and the Trans-Andean Railway, which will divert into the Andean region a great deal of traffic that has hitherto gone around it, and will also make more accessible the mines, which are the great Peruvian resources. Some of these mines are from 10,000 to 17,000 feet above the sea. The great "banks" are said to have a value in gold of 20 to 30 cents per cubic yard recoverable by the hydraulic system of mining, while on the plains there is much auriferous soil which might be mined by dredging. The banks or moraines are found in the Sandia region, and it has been calculated that the Bank of Poto contains more gold than has come out of California. There are also river beds and bars where dredging or sluice-mining would be possible.

A recent traveler, Mr. Enock, is of the opinion that Peru contains vast deposits of coal, and reports that in one region alone 400,000,000 tons of coal are "in sight." This, however, is practically inaccessible so long as the roads of the country are largely over mountain trails and rope bridges where the native porter is the only means of transportation.

The debt of Peru was admitted in 1910 to have quadrupled in the past three years. The issuance of a new loan of \$9,000,000 was proposed, also the Macune contract for a new railway to Ucayali, which would entail another debt of \$10,000,000.

Considerable discussion was caused, throughout the year, by a dispute with Ecuador over the boundary line, which, in the spring, brought the two countries to the verge of war. Washington, Brazil, and Argentina offered their friendly offices at that time to secure peace. The question was submitted to King Alfonso of Spain as arbitrator. He delayed expressing an opinion, intimating that the two countries might themselves come to a satisfactory agreement. Finally, on 30 December, a joint note from the mediating powers was presented to the government, advising Peru to submit the matter to The Hague Tribunal.

The new Cabinet was announced 28 October, and is as follows: President and Minister of Justice, Salvador Caverio; Minister of Home Affairs, Enrique Bazadre; Minister of Finance, Enrique Oyanguen; Minister of War, Colonel Pizarro; Minister of Foreign Affairs, Meliton Porras; Minister of Public Works, Ego Aguirre.

A Lima journal, *Peru To-Day*, published in 1910, data tending to prove that Peru has the

highest railway in the world. The altitude of the Central Railway of Peru, a broad-gauge road, reaches 15,865 feet above sea level. The highest station is Ticlio, 15,665 feet high, and it is stated that a handcar started at this point would run unaided to Callao. The line passes through 57 tunnels and over a dozen principal bridges.

George Chavez, the Peruvian aviator who was killed after flying over the Alps from Brigue, Switzerland, 23 September has become a national hero in Peru. He received honors from Italy and from France, and is buried at Pere La Chaise, with the insignia of the Legion of Honor. A solemn mass was given in his memory on 27 Oct. 1910, at Lima, and officers of the French and Italian cruisers received invitations. Business in Lima was suspended for the day, and the church of San Pedro, an ancient and magnificent building of great capacity, was crowded to the doors.

Petroleum. See PETROLEUM, CRUDE.

Pharmacopœia, Revision of the. The United States Pharmacopœia is a compilation describing the drugs and preparations used in medicine. The interests of the public are affected by it in many ways. Fixing standards of identity, purity, and strength of most of the important medicines prescribed by physicians, and giving descriptions and tests by which their identity and quality are to be determined, it is the book of reference of the United States officials at our ports of entry in their decisions as to whether drugs offered for importation are of a fit quality for use by our people. In the same way, the Federal officials in control of inter-State commerce and in the selecting of drugs for use in the territories and by army, navy, and hospital marine employ this book in their determinations.

Most of the States and many of our larger cities also employ it in enforcing their statutes against the use of spurious, adulterated, or otherwise unfit drugs and medicines. Pure food and drug laws, as we understand the term today, were still in the future when the 8th decennial revision of the Pharmacopœia (held in 1900) became official, 1 Sept. 1905. The Federal law which bears the short title "The Pure Food and Drugs Act, June 30, 1906," was passed the following year, and became fully operative on 1 Jan. 1907. This law specifically designated the Pharmacopœia as the legal standard, and thereby gave it a standing before the world which it had not previously attained. The vigorous manner in which the authorities proceeded to execute the law, at once caused thousands who had known the book simply as a name, or not at all, to buy or use it. The Pharmacopœia has thus become a part of the Federal law, as well as of the laws of many of the States which enacted statutes based on the Federal pure food and drugs act; and since the organization which owns and controls it is an incorporated body, the meeting of the United States Pharmacopœial Convention, for the last decennial revision of the work, which took place in Washington, 10-12 May 1910, exceeded in importance any of the conventions which had previously been held to make or revise the book. The far-reaching effect of the work of manufacturers and importers, retail pharmacists, food and drug officials, and practitioners of medicine made it important that

each of these interests should be well represented in the convention. Wholesale and retail druggists' organizations and medical societies, for weeks and months and even years, had been discussing the Pharmacopœia with a view, particularly, to protect the public against the evils of low-grade drugs, and at the same time safeguard their own interests by impressing upon those most interested the importance of considering the interests of all concerned. Some physicians appeared to be jealous of the expected influence of pharmacists in the convention and on the committee of revision, so that they spoke of the "capture" of the Pharmacopœia by druggists; some druggists feared that the Government would gain control of the book; and from Government sources came the intimation that certain importers and manufacturers were planning to make such an assault on the convention or its committee of revision as would force capitulation to them. But the proceedings were conducted with an utter lack of anything having the semblance of a factional fight on the floor of the meeting hall.

The United States Pharmacopœial Convention is itself an incorporated body, chartered under the laws of the District of Columbia, 7 July 1900, and is continuous, with power to conduct future revisions under the constitution and by-laws framed by the convention.

The convention for the 9th decennial revision was held in the large hall on the top floor of the New Willard Hotel, Washington, and was attended by about 325 delegates, representing about 157 medical, pharmaceutical, and chemical societies and associations, government departments, etc. The president of the convention, Dr. H. C. Wood, of Philadelphia, being detained at his home by illness, and the first vice-president, Dr. A. B. Prescott, of Ann Arbor, having died in 1905, the duty of opening and presiding over the deliberations of the convention devolved upon Dr. Otto A. Wall, of St. Louis, who performed it in a fair, dignified, and masterful manner. The report in detail of the action of the convention is published officially in the *The Druggists' Circular* for June 1910.

Doctor Wood's address was read in his absence. In it he said: "The work of the president of the United States Pharmacopœial Convention during the 10 years that elapse between the successive meetings of the convention, is little more than that of a member of the board of trustees and the committee of revision."

"The Pharmacopœia produced by the committee of revision is generally acknowledged to be the best ever made; it has also been recognized by Congress, so that in matters within its scope it is the law of the land; while the Spanish translation has not only been made the official Pharmacopœia of Cuba but every drug store in that island has been required by law to have a copy of the book."

"In the opinion of your president the future life of the United States Pharmacopœial Convention rests largely upon the labors of the committee on credentials and arrangements, and the subsequent action of the convention in reviewing the work they have done. The position of the convention is so anomalous that a parallel is very difficult to find, but the lighting and buoying of the English coast is under the control of a corporation which is analogous to the United States Pharmacopœial Convention

in that it exercises legal governmental authority although an independent body. Its power to erect and take charge of the lighthouses and beacons of the coast of England was given to it by Queen Elizabeth in 1573; and its work has been so satisfactory that while the coasts of Scotland and Ireland are under government care, the Brothers of the Trinity still remain masters of the English coast.

"As it was with the Corporation of Trinity House, so, in the early days of the American Republic, the Convention of the United States Pharmacopœia was originated, not by law but by voluntary action and consent. But, to-day, incorporated and its actions legalized, it constitutes the power which regulates the relations between the professions of pharmacy and medicine and gives the standard of legal purity for certain substances used widely for other than medical intent.

"The Corporation of Trinity House has maintained its supremacy and the character of its work by its conservatism, and by its refusal to widen the circle of the executive or the character of its membership. A similar case to that is the United States Pharmacopœial Convention, which, to the great benefit of the professions of pharmacy and medicine and of the people of the United States, will best maintain its own existence by conservatism, by guarding well the portal of entrance to the convention, and by making scientific and practical fitness rather than geographic representation the requirements for membership."

The report of the board of trustees recommended that there be a change in the number of members on the revision committee, from 25 to 50; also that the new general committee of revision select an executive committee of 15 to which the immediate work of revision shall be entrusted, reserving to the general committee certain advisory and supervisory powers, and the duty of filling vacancies which may occur in the executive committee. These recommendations were adopted.

While necessarily lengthy, the report of the chairman of the committee of revision (Prof. Joseph P. Remington, of Philadelphia), contained little that was not already known to those who had kept in touch with pharmacopœial matters through the medical and pharmaceutical press. The 8th revision contained hundreds of ill-defined and otherwise faulty statements, relative to standards of identity, purity, and strength of drugs, average doses, assay processes, formulæ, and other important pharmaceutical matters. For example, through poor verbal construction, certain drugs, though adulterated, met the requirements of the Pharmacopœia. Certain drugs imported into this country were not standardized at all. The difference between some powdered drugs and the whole drug was not specifically recognized. And the facts did not appear that certain drugs should be made from the seed and certain others from the pulp of the plant producing it; and that the identity of certain drugs should be tested microscopically as well as chemically.

The present revision will become official in 1915. This allows ample time for its provisions to become known. It is expected it will take two or three years to prepare and publish it.

In accordance with instructions received from the convention of 1900, the retiring committee of revision had prepared a draft of a

set of principles to be followed in revising the Pharmacopœia, which were read by Professor Remington. After some discussion, alteration, and additions this draft was adopted. Among its many recommendations is the following proposed limit to the scope of the Pharmacopœia:

"We recommend that this committee of revision be authorized to admit into the Pharmacopœia any medical substance of known origin; but no substance or combination of substances shall be introduced if the composition or mode of manufacture thereof be kept secret, or if it be controlled by unlimited proprietary or patent rights, and the list of substances should be carefully selected, with standards for identity and purity, as far as possible. Substances used only for technical purposes should not be admitted to the next Pharmacopœia, and a statement should be placed in the preface to the effect that standards of purity and strength prescribed in the text of the Pharmacopœia, are intended solely to apply to substances which are used for medical purposes or in determining the identity and purity of the same."

Another of the "general principles" of revision adopted was.

"That the committee be instructed to revise as carefully as possible the limits of purity and strength of the pharmacopœial chemicals and preparations for which limiting tests are or may be given. While no concession should be made toward a diminution of medicinal value, allowance should be made for unavoidable, innocuous impurities or variations due to the particular source or mode of preparation, or to the keeping qualities of the several articles. The 'purity rubric,' which limits the percentage of innocuous impurities, as introduced into the 8th revision, should be continued, and tests and requirements should be appended to each article carrying a 'purity rubric.' In the case of crude drugs and natural products, the limits of admissible impurities should be placed at such a figure as to exclude any that would not be accepted by other countries." Consult *Druggists' Circular* for June 1910.

Many other "general principles," equally important, were adopted. The following new officers of the convention were elected for the coming decade: President, Dr. Harvey W. Wiley of Washington; vice-presidents, Dr. N. S. Davis, of Chicago; Prof. Charles Caspari, Jr., of Baltimore; Dr. O. T. Osborne of New Haven; Leo Eliel of South Bend, Ind.; and Dr. W. A. Bastedo of New York; secretary, Dr. Murray Galt Motter of Washington; assistant secretary, Dr. Noble P. Barnes of Washington; treasurer, Samuel L. Hilton of Washington; trustees, Prof. James H. Beal of Scio, Ohio, F. W. Meissner of La Porte, Ind., William Jay Schieffelin of New York, Dr. Geo. H. Simmons of Chicago, and Prof. H. M. Whelpley of St. Louis. More than three-fourths of the members of the newly elected general revision committee of 50, with Professor Remington as chairman, are professors of pharmacy or retail druggists, identified with the American Pharmaceutical Association; the physicians on the committee are mostly government employees, pharmacologists and teachers.

The report of the 25th annual meeting of the American Pharmaceutical Association, which was held in Richmond, Va., 2-7 May 1910, is also contained in *The Druggists' Circular* for June 1910. The address of the president of

this association, Prof. H. H. Rusby (who is Dean of the New York College of Pharmacy of Columbia University, a member of the revision committee of the Pharmacopœia, pharmacognosist of the Health Department of New York City, and Federal expert on the qualifications of drugs entering the port of New York), presented important recommendations concerning the revision of the Pharmacopœia, which were adopted, and which bore fruit in the convention which was held the following week in Washington. A biographical sketch of 'The Makers of the Pharmacopœia,' by M. I. Wilbert, was printed in *The Druggists' Circular* for May 1910.

Pheasants. See GAME FARMING.

Philadelphia, Pa. According to the 1910 census Philadelphia has a population of 1,549,068, a gain of 19.7 per cent over 1900. It is the 3d city of the Union. Philadelphia has an area of 129½ square miles. Its miles of streets amount to 1,837 of which 1,356 are paved. The assessed value of the real estate is \$1,315,269,657 and the personalty \$2,022,356. The tax rate is \$15 per 1,000. Philadelphia's public debt is \$84,001,620. The annual cost of maintaining the city government is \$34,117,011, of which \$5,722,947 is spent on schools that have 211,051 pupils and 4,500 principals and teachers; \$1,387,761 for the fire department of 955 members, and \$3,820,181 for the police force of 3,589 men, whose annual arrests average 80,879. The city owns the water works. They cost \$65,000,000. There are 1,612 miles of mains. The average daily consumption of water is 306,017,000 gallons. The daily capacity of the water works is 528,790,000 gallons. There are 1,185 miles of sewers. Philadelphia spends \$1,299,000 for street cleaning and the removal of ashes. The annual death rate is 15.85 per cent. The birth rate 24. Philadelphia is the third city in the union in the value of its manufactured output. It is the home of the famous Baldwin Locomotive Works and Cramp's shipyards, two of the largest concerns of their kind in the United States. During Feb. 1910, The Amalgamated Association of Street and Electric Railway Employees went on a strike against The Philadelphia Rapid Transit Company. This was the second strike within a year. The demand of the men was for more wages and the exclusive recognition of their union. This strike was followed by a sympathetic one of 60,000 union men on 7 March. Much violence ensued before the trouble was adjusted.

Philanthropy, New York School of. The New York School of Philanthropy is a practical institution for teaching sociologists and economic reformers how to go about the work of emancipating mankind from misery, want, and suffering. The Charities Organization (q.v.) selects most of its workers from among the graduates of this school, and in almost all parts of the United States products of its teaching are directing the systematized work of ministering to the needy. Philanthropy, after passing through a long and chaotic stage of evolution, has finally, in tune with the general advancement of the age, reached a scientific plane. No longer is the important work of relieving the poor left to the chance generosity of moneyed persons. That class still supplies the funds, but it is merely for the capitalization of the enterprise. The active

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work of relief is carried on by societies which devote their entire time and attention to it, so that charity has become one of the most highly organized activities in the world. There is almost no phase of modern social or sanitary life which the charitable societies do not daily touch. To carry on such work in an effective fashion a specialized training which, in the ordinary nature of things, no person, however charitably disposed, could have, is absolutely indispensable. This the New York School of Philanthropy is doing.

During the school year 1909-10, 118 students took the course there, of whom more than 95 were women. They enjoyed extensive lecture courses delivered by the highest sociological experts, among whom were Prof R. C. McCrea, Anna Garlin Spencer, Professor Devine, Dr. Henry Moskowitz, Kate Halladay Claghorn, and Dr. David Blaustein. These lectures covered practically all branches of sociological importance, labor, tenement houses, congestion, child labor, tuberculosis, crime, etc. The theoretical, inspirational work of the classroom was augmented further by so-called "field classes". These classes go out, under the guidance of some recognized charity worker, and examine first-hand the problems and conditions which they have been studying from afar at the school. The result is a thorough comprehensive knowledge of the state of the present social structure. When this course has been completed the student is in a position to deal intelligently and effectively with the conditions which he seeks to improve, and no time nor money is wasted in fruitless experimentation. The training of the School of Philanthropy tends to remove charity more and more from the dominance of sentimentality. Individual cases of distress, although alleviated wherever possible, are subordinated to the aspects of a general condition. All efforts are preventive in their nature, making for total elimination rather than partial restoration. In this way the New York School of Philanthropy is making itself one of the most potent forces in the land for civic social betterment, and the importance, scope, and significance of the work it is so unostentatiously making possible can scarcely be overestimated.

Philippines, The. *Area and Population.*—

These Islands belonging to United States, and lying off the southern coast of Asia, are between longitude 120 and 130 and latitude 5 and 20. The land area is about 140,000 square miles. There are approximately 2,000 islands in all, chief among which are Luzon, 44,400 square miles; Mindanao, 34,000 square miles; Leyte, 3,800 square miles; Negros, 3,300 square miles; and Cebu, 2,400 square miles. The last census gave the population as 7,635,426, about 7,000,000 of whom were to a greater or lesser extent civilized, and were principally Malays. There is a population of 67 to every square mile of territory, being about thrice as dense as in the United States. There are about 36,000 Chinese, and 14,000 other foreigners. American civilians number 8,135. There are many different tribes, the principal being the Visayans, the Ilocanos and the Tagalogs, the latter being nearest Manila. The birth-rate is 4.8 per cent, and the death rate 3.2 per cent of the population. Manila, according to latest figures, has about 220,000 inhabitants, and there

are four other towns with more than 10,000 inhabitants each.

Civil Administration.—Prior to 1902 there was a military governor over the Philippines, but in that year Congress passed an act, constituting a civil government, and William H. Taft was appointed governor. The present governor is W. Cameron Forbes. There are eight commissioners in the government,—three natives, and five Americans. There are ministers of Interior Finance, Justice, Commerce and Police, and Education. The islands are grouped administratively into 39 provinces, each with a sub-governor, a supreme court, and 14 judicial districts. A Philippine Assembly was opened 16 Oct 1907, where a total vote of 97,803 was registered. The question of native fitness for the franchise in the Philippines is a mooted one indeed. *The Political Science Review* for Nov. 1910, contains an article contributed by Mr James A. Robinson, librarian of the Philippines Library, in which he refers to the actions of Philippine Legislature of March-April as sufficient evidence of Filipino competency to rule. The writer avers that little party feeling was manifested, and cites the defeat of an ultra-radical (Dr Dominador Gomez, labor-leader) as a proof of native conservatism. Secretary of War Dickinson, however, in his report to Congress on the Philippine situation, 6 Dec. 1910, declared the natives unfit for home rule. He said in part, "The Filipino people are substantially in the same attitude as when you visited them in 1907. Training in administrative work and education is doing much, but they have affected such a small percentage of the population that the change is hardly sensible. . . . It is a delusion if the present policy of control of the islands by the American people shall continue to encourage the Filipino people in the hope that the administration of the islands will be turned over to them within the present generation."

Mr. Dickinson, in his visit to the Philippines in 1910, investigated charges preferred against Frank W. Carpenter and Dean C. Worcester by Representative Martin, wherein it was averred they had disposed of certain friar lands, and the Secretary in his report exonerated them. Japanese influence in the Philippines, is said to have dictated the following paragraph of the Secretary of War's report: "In my opinion this country cannot, as far as its land forces are concerned, be considered in a state of readiness for defence or to repel invasion, if attempted on our coasts by any first-class power having the shipping to transport and the navy to protect the transit of her armed forces over the sea."

Banks and the Post Office.—Filipino depositors in the postal savings banks, according to the Secretary's report of 6 December, increased from 4,927 in 1909 to 8,547 in 1910, and constitute 65 per cent of the total depositors. In June 1910 there were 233 banks doing business, an increase of 42 in one year, carrying deposits of \$115,000 in excess of the previous year. The interest paid depositors for 1909-10 amounted to about \$14,000. A loan business on real estate is being worked up. A parcels post is being established by the Philippine Government. Already there is an arrangement between the islands and Hong Kong. Parcels up

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to 11 pounds weight and $3\frac{1}{2}$ feet in length can be transmitted from Hong Kong to the Philippines at the rate of 12 cents per pound. Articles of any kind may be sent, except poisons, explosives, liquids, confections, pastels, live or dead animals, fruits, and vegetables.

Justice, Religion, and Education—The most conspicuous action of the Supreme Court in 1910 was that which disposed of the Manila Renaissance prosecution by sentencing Theodore Kalaca, a member of the Philippine Assembly to one year's imprisonment and a fine of \$3,000, and Martin Ocampo, to six months' imprisonment and a fine of \$2,000, for having criminally libelled Commissioner Dean C. Worcester. Mr. Worcester was awarded \$30,000 damages. The civilized tribes of the islands are nearly all Roman Catholics. The Catholic Church is strongly supported, and there are a great many functionaries. The value of the church buildings is about \$20,850,000. The Moros tribesmen are Mohammedans, and other wild peoples are adherents of no particular belief. There is an Episcopal bishop in the islands. The Americans have revolutionized the educational system of the Philippines. At last reports there were 811,700 attendants at the schools, under the instruction of about 4,800 native and 1,200 foreign teachers. English is widely taught, and the Filipinos manifest an ardent desire to acquire the language. There were more than 40 newspapers published (12 in English) according to last census. Twenty-four were Spanish, four native, and one Chinese. There is very little pauperism in the islands. There are about 1,670 receiving public assistance.

Agriculture—About one-ninth of the land is cultivated. The soil is fertile, so fertile that it is estimated that it would support a population of more than 40,000,000. The leading products are as follows: rice, hemp, corn, sugar, tobacco, coconuts, and cacao. Hemp constitutes two-thirds of the value of all exports. The production of cotton and coffee has dwindled to insignificance on account of competition in the first instance and insect invasion in the second. Rice and corn are grown chiefly for home consumption. Tobacco is grown on nearly all the islands. Implements for agriculture to the value of \$50,000 were imported in 1910.

Commerce—The imports into the Philippines for 1910 amounted to \$37,067,630, exceeding those of 1909 by \$9,275,222. The export trade, amounting to \$39,864,169, showed an increase over the previous year of \$8,870,606. The establishment of free trade with the islands was a great benefit judging from the effect produced upon United States imports, which doubled in value in 1910, and upon the exports, which increased more than 80 per cent. That the new trade relations had no derogatory effect upon foreign commerce is evidenced by the following figures: Total 1909 imports from foreign countries (United States excepted, of course), \$23,100,627; for 1910, \$26,202,329. Great Britain contributed the value of \$5,567,151 for 1910; Germany the value of \$1,078,352; France, \$1,032,278; Spain, \$1,366,722; Switzerland, \$543,167; China, \$2,700,599; Hong Kong, \$505,943; Japan, \$2,241,747; British East Indies, \$971,177. The distribution of the Philippine cloth trade in 1910 was as follows: United Kingdom, \$2,544,210; United States, \$1,911,338; Japan, \$585,952; etc. Bread stuffs imported in

1910 were valued at \$1,916,951; rice at \$5,321,962; and vegetables at \$664,727. Wheat flour shipped to the islands was worth \$1,098,823. The importation of meats and dairy products was valued at \$2,377,466 in 1910. Australia supplied most of the fresh beef and pork and China the lard, hams and bacon. Denmark supplied the greatest amount of butter, the Netherlands the cheese, and Great Britain the condensed milk. About 90 per cent of the mineral oil imports were from the United States. France supplies perfumes. The soap entering the island bears British and American trademarks; the beer is American; the wine Spanish and French; and the distilled liquors are mostly British and American. The total value of imports into the United States from the Philippines in the first 15 months' operation of the new tariff law amounted to \$24,333,000 against \$11,500,000 in the 15 months immediately preceding the enactment of that law; while the exports to the islands in the 15 months are \$23,333,000, against \$12,500,000 in the 15 months immediately prior to its enactment. Since the new tariff arrangement, the prices for sugar have increased, and the production of cigars has been enlarged to meet the demands of the open market. Sugar increased from 134 cents per pound in 1909 to 2½ cents, with every indication of showing an increase in value of over \$2,500,000. Exports of cigars increased from 115,977,000 to 196,192,000, of which more than half went to the United States. The unprecedented exportation of hemp in 1910 was 108,090 tons. United States purchased the value of \$10,000,000 of hemp, from a total output of \$17,000,000. The record of the Philippine customs service shows for 1910 in comparison with 1909 an increase of \$9,275,233 in imports, or 33 per cent.

Climate and Health—The occupation of the islands by Americans has greatly reduced the death rate. Modern sanitary methods are being employed. The death rate of 1910 was about 5 per thousand less than that of the previous five or six years. These hopeful conditions obtain, it is understood, as a result of the installation of a new water system. A campaign was conducted in 1910 against the mosquito plague, the efforts to extinguish the pests being confined to breeding places. A report reached Washington in Nov. 1910 to the effect that native liquors were responsible primarily for the deplorable actions of American soldiers. The liquors seem to have the effect of crazing Americans, and Brig.-Gen. Ramsay D. Potts would have the army supplied with less harmful beverages, from America. The climate is subject to typhoons, a serious one occurring in Sept. 1910, leaving 1,000 homeless.

Nationality Hatred and Disturbances—In the New York Sunday Times, 4 Dec 1910, is contained the following statement, purporting to come from Bishop Charles H. Brent of the Philippines: "The Filipinos do not like the Americans. This dislike exists almost entirely among the Filipinos of the upper class. They are quite frank about it. What would suit them would be to have us leave the island—the sooner the better—and they do not hesitate to let us Americans know this. As for the lower classes, they do not feel that way. As long as those who govern them do not oppress them they do not really care who their masters are."

Spanish or Americans—it is all the same to them.' Bishop Brent declared there was more popular government in the Philippines than in any oriental country, even though the natives did not like the Americans. Since the first of Sept. 1910, there have been frequent disturbances in the islands. In September an uprising took place against the Government in the Province of Nueva Vizcaya, headed by a malcontent—Simeon Mandac—formerly governor of one of the provinces. The result, however, was quickly suppressed. According to a report reaching Washington at the end of October, labor troubles in that month were responsible for native broils resulting in the death of two Chinese and eight Christians, one of whom was an American. The Manobos tribesmen were the chief participants in the October outrage, which was quashed by two companies of the Third United States Infantry. The Manobos, it appears, are indolent, and efforts to induce them to work by foreign planters have brought frequent disturbances, particularly on the West Coast of Davao. Mandac was sentenced to 20 years imprisonment in October. In November several of the hostile Manobos on Mindanao Island were killed, as a result of an uprising. Exasperated by the Manobos' unceasing hostilities, General Pershing in December, declared his intention of subduing those disturbances by adequate punishment, and an expedition began in December, which should not terminate (he said) until the natives should understand that the Government must be respected.

Philological Association, American. The association held its 42d annual meeting at Brown University, Providence, R. I., in conjunction with the Archæological Institute of America. The sessions were largely given up to the reading of papers on philological subjects. Prof. John C. Rolfe of the University of Pennsylvania was elected president for 1911. The association's annual volume of 'Transactions and Proceedings' appeared in Dec. 1910. The membership is now 650.

Philosophy. This is doubtless the most important philosophical doctrine that has arisen in recent years. The word is derived from the Greek, meaning 'action,' and the fundamental postulate of the system is that any doctrine is right which 'works.' A philosophy, in short, to have any value in its practical application and bearing on life, must be one capable of being 'lived up to,' and understood by the man-in-the-street; and it is because of these eminently valuable qualities that pragmatism has gained the host of friends it has; and it is partly on this account that it is so bitterly assailed by the academic philosophers.

The three great defenders of the doctrine are Prof. F. C. S. Schiller, of Oxford; Prof. John Dewey, of Columbia University; and Prof. William James, of Harvard. To the American public it is intimately associated with the name of the last-named, owing doubtless, to the publication of his book, 'Pragmatism.'

In Prof. Mark Baldwin's 'Dictionary of Philosophy and Psychology,' Professor James defines the principle as follows:

'The doctrine that the whole 'meaning' of a conception expresses itself in practical consequences, consequences either in the shape of

conduct to be recommended, or in that of experience to be expected, if the conception be true; which consequences would be different if it were untrue, and must be different from the consequences by which the meaning of other consequences is in turn expressed. If a second conception should not appear to have other consequences, then it must be really only the first conception under a different name. In methodology it is certain that to trace and compare their respective consequences is an admirable way of establishing the different meanings of different definitions.'

One or two quotations from Professor James' book on Pragmatism will doubtless summarize his views on this great question succinctly and correctly. He says

'Ideas (which themselves are but parts of our experience) become true just in so far as they help us to get into satisfactory relation with other parts of our experience. . . . Purely objective truth, truth in whose establishment the function of giving human satisfaction in marrying previous parts of experience with newer parts plays no rôle whatever, is nowhere to be found. . . . Truth is one species of good, and not, as is usually supposed, a category distinct from good, and co-ordinate with it. The true is the name of whatever proves itself to be good in the way of belief, and good, too, for definite, assignable reasons. . . . True ideas are those we can assimilate, validate, corroborate, and verify. False ideas are those which we can not. . . . The truth of an idea is not a stagnant property inherent in it. Truth happens to be an idea. It becomes true,—is made true by events. Its verity is in fact an event, a process; the process, namely, of its verifying itself, its verification. Its validity is the process of its validation. . . . The practical value of true ideas is thus primarily derived from the practical importance of their objects to us. Our account of truth is an account of truths in the plural, and processes of leading, realized *in rebus*, and having only this quality in common, that they pay. . . . Truth is *made*, just as health, wealth, and strength are made, in the course of experience. . . . The 'True,' to put it very briefly, is only the expedient in the way of our thinking, just as 'the right' is only the expedient in the way of our behaving. . . . On pragmatic principles, if the hypothesis of God 'works' satisfactorily in the widest sense of the word, it is true.'

Phosphates. The work of determining and classifying the nation's phosphate deposits has been vigorously continued, says the director of the United States Geological Survey in his report for 1910. As fast as discovered, phosphate lands have been withdrawn from entry in the expectation of Federal legislation to remedy the defects in the conflicting mineral laws employed in acquiring these lands and for the further reason that "the maintenance of the agricultural wealth of the country requires that the exportation of these supplies of valuable plant food be prevented by some effective method." This, it is believed, can be readily accomplished by legislation so far as the government phosphates are concerned. Phosphorus is one of the three necessary elements of plant food, and the world's supply is comparatively scanty. Fortunately the public land

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states contain large deposits of phosphate rock, probably the largest in the world, and it is believed to be sound policy to keep the phosphates for American farmers. There is no intention of hindering development for domestic use. New withdrawals of phosphate lands were made during the year in Idaho, Utah, Wyoming and Florida, aggregating 401,954 acres making the total area withdrawn at the end of the year 2,594,113 acres. Restorations were made of 2,322,416 acres previously withdrawn but found on field examination to be not underlain by phosphates. The deposits in the Northwest country of Idaho, Wyoming, and Utah are probably the largest and richest in the world. From surveys recently cast up in totals these deposits show evidences of 267,000,000 tons of high grade phosphate rock, while the chances are that millions of more tons may be added to this total before the pay rock is exhausted. These deposits show the rock in pebble formation, closely cemented in masses and containing some calcite. The round particles vary from a microscopic size to pebbles half an inch in diameter. In color the phosphate rock ranges from a gray to a jet black, the black probably due to carboniferous matter.

Photography. The possibilities of photography were developed within the few years preceding 1911 into the realm of what formerly seemed the impossible. While the development of photography as an art has produced effects of high artistic merit, the science of photography has made the greatest advances. It has developed in several directions, each of which is worthy of special consideration.

Color Photography.—The discovery of the sensitiveness of certain compounds to the action of light first made apparent the opportunity toward color photography. Limitation was set on development, however, by the silver film, which refused to take other impressions than to become dark by light action, and as this remained the most important feature in photography, other means had to be sought to obviate the difficulty.

To intercept the colors by light filters and secure separate color results, various ways were tried, but the care and skill necessary to this work early prevented its development. Then, in 1908, the "autochrome" plate was introduced, which was able to transfer the colors to glass, so that the glass could be held to the light and the picture was reproduced in the exact colors in which it appeared in reality. This was an important step forward, but had the difficulty that the plate was slow and was so dense that it could not be successfully used in reproduction by a lantern of ordinary power. Only one result could be obtained from one exposure.

Simultaneously color photography was arrived at in an entirely different manner, producing what has come to be known as the "Thames" plate. This proved so rapid that instantaneous work was possible and it was so clear that lanterns of small illuminating power could use it. Also any number of results in color could be obtained. The action of plate is based on the fact that the sun's light is not quite white, but a combination of colors which can be combined into the three primary colors, red, green, and blue. The action of the plate is caused by a color screen which

has the effect of sketching in the object photographed. This is made by putting down on glass patches of the three primary colors in regular order to the extent of 70,000 to the square inch. The sensitive surface is like a dry plate except that it is sensitive to all colors. The plate is prepared in two forms. By the separate method the color screen and sensitive coating are on two separate glasses. By the combined method the color screen and sensitive coating are on the same glass. The color screen is always used in front of the sensitive coating.

In Nov 1910, Dr Robert W. Woods, professor of experimental physics at Johns Hopkins University, photographed light waves invisible to the eye. He reproduced landscapes in which infra-red and ultra-violet rays appeared, which had never been seen before. His reproductions were startlingly beautiful. This discovery is valuable scientifically chiefly in astronomy, but also disclosed colors which greatly enriched the coloring of the earth.

To secure this effect Doctor Woods explained that he constructed a screen or ray-filter by combining a sheet of very dense cobalt glass with a deep orange aniline dye. This screen absorbed all the rays below wave length 6,900. The spectrum of the sun or arc photographed through this screen on a Cramer or Wratten and Wainwright spectrum plate has reduced to a band in which the rays are visible to the eye, if all other rays are excluded, but they are seldom seen on account of their feeble action on the retina of the eye. They are termed infra-red to distinguish them from the brighter red in the region 65-69. By this means Doctor Wood succeeded in making grass and trees in the full sunlight appear as if snow white and the sky black.

Photographing the Voice.—Doctor Narage, the French physicist, announced in Nov 1910, the discovery by which the voice could be photographed. The sound strikes a small disc of India rubber, the vibrations of which are minutely and exactly reproduced on a small mirror. A ray of light is thrown on the mirror, which reflects the vibrations at various angles. A sensitive film unwound by clockwork receives the impression of these reflections. The picture indicates whether the singer's voice is true, whether his tempo is correct, and whether his method of breathing is right. A true note is shown by a series of parallel and equal bands, while a wrong note produces a rough, irregular impression. A camera of this kind will prove valuable to singers, orators, and actors to test their own voices and see if they are correct.

Photographs Sent by Wire and Wireless.—A number of inventors appeared, during 1910, with devices capable of transmitting photographs by wire. The originator was the German Professor Kern, an electrician, but the field has been invaded by other inventors, who have been at work perfecting devices, one of them, T. Thorne-Baker, even perfecting an apparatus capable of transmitting a photograph by wireless.

The Thorne-Baker apparatus records electrochemically, not using selenium cells, and the print is made in a sensitized fish glue on lead foil. As in the gelatine process in photography, all that portion of the plate not acted upon

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by the light is washed away, and the remaining impression is wrapped on a drum. The receiver consists of a similar drum with a platinum stylus tracing a helical line on a paper impregnated with a colorless electrolyte, the manufacture of which is a secret. Whenever the transmitter of the stylus touches a clear portion of the metal foil, a current flows to the receiver and a dark spot appears on the chemical paper. The lead foil reproduction is characterized by thick and thin lines, with intervening spaces. The lead base or ash glue lines are touched by the stylus and the width of the line determines the length of contact. So the periods of the line currents are regulated by the width of the lines.

Synchronism is the most difficult problem in securing results according to this method. Professor Korn, however, solved this matter by a delicate adjustment of currents, with the result that the impression made on the receiving plate is remarkably accurate and the photograph is telegraphed through space and indicated clearly at the other end of the line.

Photographs are transmitted by wireless through an ingenious use of electric currents. A small incandescent lamp is so placed that it lights or is extinguished according to the action of the lines on the photographic plate. The light is fixed on a revolving photographic film and accurately ticks off the lines, as in the method by wire. The currents generated are accurately recorded in the receiver and the result is a reproduction of the photographic plate from which the picture is taken. The method is very intricate and shows great fertility of mind in adapting existing mechanical means to the end desired.

Photographing Projectiles in Flight—The electric spark has made it possible to fix the bullet in its flight at one spot. The method has been developed in Germany. Albert Preuss, a shot gun expert, first introduced the photography of projectiles in this manner to study the effect on shot and showed every individual grain of shot. The most interesting fact brought out by the method is that the air is condensed in front of the projectile and is shown in the plate. Where several grains are photographed close to one another the plate shows where the air-waves overlap. And behind the entire charge the air eddies breaking over each other are visible.

The experiments were made in a dark cellar, where it was possible to switch on white or ruby light. The apparatus consists of a static electric machine, two Leyden jars in the centre, and a combination of gun and photographic apparatus. The plate is hung in the open and opposite it is located the spark gap, two points between which the spark is visible. Two vertical sheet-metal strips are so placed that when the gun is exploded they touch each other and a current is caused which lights the small electric lamp at the right moment to disclose the bullets in flight.

The work of photographing objects in flight has been carried to the point in Germany, where an object is held in space for one-ten-millionth of a second. This has led to the invention of the "ballistic cinematograph," which was exhibited for the first time at the International Photographic Exhibition at Dresden in 1910. Instead of giving only 50 impressions

a second, like the ordinary kinematograph, the new instrument makes it possible to show the effect of projectiles upon striking objects, the flight of insects whose wings are invisible. The effects of projectiles when striking a human body are also shown, and the amount of damage done by a fast or a slow bullet can be determined. Upon photographing a bullet into an exposed bone one print showed the bullet entering and raising a slight cloud of bone dust. The next showed it already through, leaving merely a hole behind it, but in the following pictures the bone was shown as it splintered, each process being outlined clearly.

Photography, Motion. See MOTION PHOTOGRAPHY

Photo-Sculpture. The French sculptor Cardin, in order to secure the requisite number of photographs upon which to work in modeling a bust, has discovered a method of photo-sculpture. Photographs taken for this purpose were used early in photography by placing a series of cameras about the model. Under the new process the model is placed before three mirrors, so placed as to give one rear view and two profiles. The front view is taken directly. Four pictures are thus produced and to increase these into the requisite number giving a fairly accurate semblance of the model a metallic base is erected with a rigid vertical rod in the center, and the photographs are placed in metallic slides in the grooves on the four sides of this rod. On two of the sides, at right angles to the base, are fixed jointed systems bearing long needles which slide in their supports and may be inclined at various angles. Two of the photographs, the full face and profile, are placed on the slides in a definite position. The tip of the nose is chosen as a point and the needles are slid along in their support until they touch, indicating the radius of the nose, if the head were turning. The central rod is then covered with plastic material and the work of reproducing the photograph follows. Various points are selected until the head is fairly well "pointed." The sculptor need not do this work himself. Usually skilled workmen are employed.

Phrenology, New. Character told by colored-light flashes thrown into the eyes is the discovery of John Gray, a member of the British Association of the Anthropological Institute, who, in 1910, concluded a long series of experiments in what he calls the new phrenology. The inventor explains that a correct estimate of character can be made by measuring the degree of preservation or persistence of the nervous current in the brain. The machine which measures the preservation consists of a revolving mirror mounted on an axis. At one end of the axis is a handle for turning it and at the other is a speed indicator which tells the number of revolutions the mirror is making. The mirror, as it revolves, projects two different colors in rapid succession into the eye of the individual who is being tested. When the mirror is moved very slowly these colors are seen as a sort of flickering light. But as the speed increases the colors gradually fuse until at a certain point the flicker disappears and a steady light is seen representing the mixture of the two colors. The speed is read from the indicator at the instant

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Monument in the National Museum, Washington, D. C., to Daguerre, the Discoverer of the Art of Photography

when the individual who is being dealt with states that the flicker has disappeared. From the reading of the indicator at this point the perseverance is ascertained. When the perseverance has been measured in this way the character of the person is read off from a chart in which the different kinds of intelligence are shown. The two extreme classes in this chart, persons with the highest and lowest degrees of perseverance, are likely to suffer from insanity, but of quite different kinds. Those with the lowest perseverance are liable to develop acute mania and those with the highest are liable to melancholy. The intervening classes represent different kinds of mental character among sane persons. Average perseverance points out the ordinary common sense man. When the perseverance is below the average ideas flow more quickly and people one degree below have witty, brilliant, suggestive minds, and are tactful, self-possessed, and bold. Two degrees below indicate frivolity, weak moral character, and superficial minds.

Physical Culture. During the past few years, a great wave of interest in physical culture and all allied questions has swept over this country and England, due, in part, no doubt, to the incentive furnished by public attention to college athletics; in part, to the Marathon races, prize fights, etc., which have been so publicly discussed in the press; and, in part, to the spread of numerous magazines, books, and publications of all kinds, scattered broadcast, which have stimulated interest in this subject. Undoubtedly public enthusiasm for these questions is spreading; and this is evidenced by the increasing number of vegetarian restaurants, physical culture exhibitions, etc.; and, in spite of certain defects and drawbacks, it is certain that the movement has, on the whole, accomplished great good, and is one of the most prominent factors now operative, in favor of simple, wholesome living,—as opposed to the modern degeneration of our cities. Physical culture, in its widest sense, embraces all that goes to the upbuilding of a healthy man or woman, mental and physical, and hence encourages not only athletics of all kinds, but anything and everything which tends towards a healthier life and sounder moral outlook. To many reformers, indeed, this latter aspect of the question is the most important of all; they realize that, in the battle of life, as fought in our cities, success does not depend upon "big muscles" so much as it does upon a sound and healthy body, upon stamina, upon a strong brain, and clean moral life. The enthusiastic "physical culturist" is he who opposes effeminate luxuries,—especially when carried to excess; and all practices which deaden and weaken the mind and body. The most effective way of opposing sexual excesses, degeneration, opium and morphine habits, drink, gluttony, and many kindred ills, from which humanity suffers to-day, is, according to the physical culturist, to instil into the mind the idea that health is ideal; and in the constant and earnest effort to attain this, all these evils will naturally be avoided. In the estimation of many physical culturists, healthy, outdoor sports and pastimes will do far more to rid the world of morbid cravings and excesses,—more to eradicate drink and its attendant evils,

than all the moral and religious suasion,—more than all other influences combined. There is doubtless much truth in this contention; and England is beginning to realize this fact and to act upon it. Were sports and pastimes to receive more support and encouragement in this country, there is no doubt that many of the ills of modern civilization would disappear, to a great extent; and physical culture, applied in its broadest sense, may thus be said to constitute a most potent weapon with which to combat degeneration of all sorts that has yet been secured. The sober reformers realize this fact, it is said, the better.

Physics. It has been said with some truth that the science of physics has made more real progress during the past decade than in all the hundreds of years which preceded it; and in a sense this is doubtless true. The reason is, that, for hundreds of years, physical science has been preparing, by a gradual series of discoveries, for the work of the past decade, the years of work have been but the 'flowering,' or culminating point, of the experimentation which has gone before. Thus—the X-Rays, and all the important phenomena and deductions which followed from their discovery, (as to the nature of matter, the constitution of the universe, etc.), would have been impossible but for the invention of Crookes tube; the Crookes tube would have been impossible but for the discovery of air pumps and vacuums; and this, in turn, depended upon the earlier work of Lavoisier and others on the composition of the atmosphere. It will thus be seen that the progress of physics has been natural; but the results of the few years which have elapsed since the discovery of the X-Rays and of radium, have added more to genuine scientific knowledge, and a correct interpretation of natural phenomena than all the years which have preceded them,—the reasons being obvious enough.

Modern physics has been so closely associated with the phenomena of radium and radioactivity (q.v.) that other phenomena have been lost sight of, to a certain extent, in the estimation of the public, by this all-absorbing subject. In a sense, this is but natural, since the most startling discoveries of modern physics have followed this line of investigation; but "physics" embraces, it must be remembered, many other questions also—the nature of light, of sound, heat, electricity, magnetism, and any and all forces in the universe. The science of astrophysics has claimed a large share of attention; and indeed, it has been said,—not without some sense of humor,—that "physiology is becoming chemistry, and physics astronomy." The reason for this is, that physics has become in the late investigations, so closely associated with the problem of ether, that this close inter-relation has become imperative; the 'ether of space' being the medium across which light is conveyed from the most distant stars. This is a subject which is, at the present time, causing more speculation and controversy than any other question in the whole realm of science. (See ETHER). Sound is propagated through the air; but all other energies are conveyed across space by means of the ether—from the furthestmost star, no less than from one wireless station to another. Thus, a close investigation of the nature of ether,—of its existence, and of its properties—has become of prime

importance, not only in all purely theoretical speculations such as those connected with cosmical theories, but in such practical experimentation as wireless telegraphy and telephony (qv). The practical generation and application of electricity has assumed an ever wider and wider application in manufacturing and all industrial arts; electric power and its correct transmission has revolutionized our means of travel, our lighting, heating and a thousand other features of modern civilized life. The perfection of the telephone has had a wonderful effect upon business in all its many branches and ramifications; while the practical application of electrolysis in the analysis and synthesis of various commercial products has rendered possible an output of numerous articles and substances which would otherwise have been impossible. Such, then, are a few of the results which have accrued from the application of electrical knowledge, during the past few years.

But the apparently theoretical knowledge gained by physicists has been turned to practical account in other ways also. In medicine, radium and the X-Rays have been tried for the cure of cancer and other skin affections, with more or less success; and here again it will be seen that what at first sight appears to be the work of the theoretical scientist, has also a practical bearing upon work in other fields, and upon human life and thought in general.

Most of the problems dealt with in modern physics have been discussed elsewhere in this volume (Consult: Light; Electricity; Atmospheric Electricity; Telephone; Telegraph; Wireless Telegraphy and Telephony; Radium; Radio-activity; X-Rays; Ultra-violet rays; infra-red rays; matter; ether; energy; electrolysis; electron; electric light in medicine; cosmical theories; life; etc.) For this reason they need not be again discussed in this place. It is of importance, however, to note, in this connection, one or two of the most fundamental and striking of the newer theories which have been advanced of late years,—based on the latest conceptions of physical science. Of these, one of the most important is, doubtless, the theory, proposed by Arrhenius, of the propagation through space, of life-containing particles by means of light-energy.

The doctrine, that life may have had its origin elsewhere, and been merely dropped or deposited on our planet, after being carried across space for thousands, if not millions of miles, is no new doctrine. It was advanced by Lord Kelvin and other men of science many years ago, and in modified form has been called the hypothesis of *panspermia*. There are many objections to the doctrine;—not the least of which is the fact that it does not explain the origin of life on the planet from which this imaginary speck was taken; but, this objection apart, there remained the practical difficulty of accounting for means by which these particles might be conveyed. Did they fly aimlessly about in space? or were they driven in one definite direction? and if so, by what means?

To this latter question, Arrhenius replies by saying that light-energy is doubtless the means by which life has thus been conveyed across vast regions of space. He first observed, and afterwards showed in an ingenious manner, that light-energy is powerful in its action; that clouds may remain suspended in space as the

result of radiation-pressure, etc. Thus, the theory was proposed, and has met acceptance in some quarters, that life was propagated from world to world in this fashion—by the pressure of light waves, extending on, indefinitely into space. "We have," he says, "several plausible reasons for concluding that spores which oppose an effective resistance to drying, may well be carried from one planet to another, and from one planetary system to another, without sacrificing their vital energy. . . . Light . . . will do no harm to the spores during their transference." And, according to Arrhenius, this is how the transference might be supposed to take place.

"If, therefore, spores of the most minute organisms could escape from the earth, they might travel in all directions, and the whole universe might, so to say, be sown with them. But now comes the question; how can they escape from the earth against the effect of gravitation? Corpuscles of such small weight would naturally be carried away by any aerial current. A small rain drop, 1-50 mm. in diameter, falls, at ordinary air pressure, about 4 cm. per second. We can calculate from this observation that a bacterium spore 0.00016 mm in diameter would fall only 83 m in the course of a year. It is obvious that particles of this minuteness would be swept away by every air-current they met until they reached the most diluted air of the highest strata. An air current with a velocity of 2 m. per second would take them to a height where the air-pressure is only 0.001 mm—i. e., to a height of about 100 km. (60 miles). But the air currents can never push the particle outside of our atmosphere."

In order to surmount the difficulty thus presented, Arrhenius postulates the operation of other forces. These forces he supposed to be electrical in character. This would carry them yet further on their journey through space. Finally, they are propelled ever onward by the radiation pressure, which bears them forward, by propelling the particles of dust to which they are supposedly attached, until finally they come into contact with the surface of some world,—in the process of formation,—and this life might be supposed to begin on such a planet.

This theory has of late received a rude shock, however, in the discovery that ultra-violet rays are very destructive to life, and that no living things can remain exposed to their action for hours together without dying. As inter-planetary space is known to be filled with these ultra-violet rays, the theory, as enunciated by Arrhenius seems destined to be disproved by later researches. If so, a very convincing and well-worked out theory as to the origin of life will have to be abandoned.

Such speculations may strike the reader as more in place in an article on biology than in one on physics; but it will be seen that the phenomena are all closely connected; and that physical science, as studied to-day, involves cosmical problems of all kinds—astronomical, chemical and biological, no less than the facts within the realm of pure physics itself. The limits of this branch of science are, in fact, becoming extended, and the various branches of science are gradually being blended into one continuous whole.

Of the theoretical and speculative side of

physics, doubtless the most interesting work in recent years has been that of Dr. Gustave LeBon—whose theories are not, however, accepted in many quarters. In his 'Evolution of Matter,' this author maintained the theory that all matter is undergoing a gradual disintegration; that it is all, so to say, radio-active; and that vast stores of energy are contained within the atom itself—"intra-atomic energy,"—which latter portion of the theory is now more or less accepted as true by the scientists. LeBon's theory is that all matter is gradually disintegrating, and becoming resolved into energy—of which matter is but the stable form. Matter, in this view, can be seen to "materialize" and "dematerialize", and in some measure these phenomena can even be controlled. The newest experiments, however, have tended rather against this view; and apparently indicate that only certain elements are radio-active—not all matter, as LeBon contended, and that the radio-activity of air, water, soil, etc., which had been observed, was due simply to the impurities and admixture of radio-active substances contained within the former. This is a question, however, which has not yet been finally determined.

The more revolutionary of LeBon's views, interesting as they may be as pure speculations, have never gained wide support; his doctrine that energy itself is slowly disappearing, and becoming resolved back, into "nothingness"—is a theory which is not accepted by the majority of physicists. As one acute critic has said: "this is not good physics; it is bad metaphysics." Still, his book 'The Evolution of Forces,' published in the International Scientific Series, has created much discussion and speculation, and is certainly well worth reading by all those interested in the speculative side of physics and its problems.

The experiments conducted by LeBon in what he called "Black Light" are very singular, and these have considerable value. He first of all discusses Invisible Phosphorescence; and having shown that such a phenomenon exists, proceeds to show that it can be made visible, on occasion; and that actual photographs can be taken by its aid, in what appears to be perfect darkness. These photographs, while they are somewhat indistinct in outline are nevertheless quite recognizable,—as are the photographs taken through opaque bodies. Instantaneous photographs have been quite recognizable;—as are the photographs taken in this manner, quite successfully. In other words, photographs may be taken upon photographic plates, by means of peculiar light-rays, to which the human retina does not respond.

As to the so-called Unknown or Obscure Forces, science is as yet unable to offer any definite explanation. The nature of life, of gravitation, and of other phenomena, remain as great a problem as they were a decade ago, and there seems no likelihood of their immediate solution. As to the nature and origin of life; that is a question for biology to settle; but gravitation is a legitimate question for physicists; and many and varying speculations have been offered in the past, by way of an interpretation of the observed facts. It still remains, however, as great a mystery as ever. The mere fact that no body exists which is opaque to gravitation, is alone sufficient to

differentiate it from all other known forces, and the speculations which have been advanced of late years seem only to add to, rather than detract from, the mysterious nature of this force. Gravitation appears to act instantaneously; yet we know that such cannot be! Here is a problem over which physicists of the future may work for many years, in attempts at its solution. See GRAVITATION.

Physiological Light. Various insects possess the remarkable quality of radiating light into space—such as the fire-fly, the glow-worm, etc. The light seems to be of the quality of a phosphorescence, and has been termed "the cheapest form of light," by some authorities, for the reason that so large a percentage of the radiated energy passes into the light; and so small a percentage into heat and accompanying phenomena. Some of those who have studied these little creatures have, indeed, come to the conclusion that 100 per cent.—or all,—of the available energy was transformed into light; and that none escaped as heat, etc. Langley and Very were of this opinion. Ives and Conbentz, on the other hand, have shown that only about 96 per cent of the energy passes into light. This is still a very high—even remarkable—percentage, however, when we remember that even in the very best artificial lights only about 4 per cent of the energy radiated is luminous; and in most cases it runs to less than 1 per cent. For this reason great efforts have been made to discover the source and mechanism of this physiological light, for, if the secret were discovered, it might mean a revolution in the manner of lighting our streets and public buildings. As yet, however, Nature has guarded her secret so well that all efforts to discover the method of lighting have failed. Every year continued and laborious studies are being made, however, and there is reason to hope that, in the course of a few years, enough will have been learned to apply the method for commercial purposes.

Although the animal kingdom is best known as a producer of physiological light of this character, it is by no means the only source from which it emanates. Various vegetable forms and molds and luminous bacteria have been found which become active in the decay of flesh and wood. Various fungi show a certain luminosity, while, of the higher plants, the marigold, the nasturtium, and other flowers have been said to emit flashes of light. As compared with the animal kingdom, however, it must be admitted that this light is devoid of the brilliancy and glitter attributable to the former.

Probably the simplest form of animal life which emits light is the *Noctiluca*, a bit of simple protoplasm, living in the ocean, and scarcely a millimeter in diameter. Millions and millions of these creatures swarm upon the surface of the sea, causing it to appear phosphorescent. Besides the *Noctiluca*, the *Beroe* and the *Ctenophores* are often present in immense numbers, causing the sea to appear "milky." The *brachy*—another sea creature,—has recently been shown to possess definite luminous organs which enable it to see its way beneath the surface of the ocean, where the light of day fails to penetrate; just as a light would enable a person to find its way about on a dark night.

PILGRIMS NEW MONUMENT — PINCHOT

Fire-flies are, however, noted for emitting the brightest light, and much study has lately been devoted to these insects. The light given off by them is said to be greenish or yellowish; but some have said it was reddish or bluish. Langley and Very, in 1890, studied the emitted light by means of the spectroscope, and found that the prism of their spectroscope resolved the light into a narrow band in the yellow and green region of the spectrum, ending somewhat abruptly, and showing a few red and blue rays. Later, Ives and Coblenz, using more delicate instruments, resolved the spectroscope into "an unsymmetrical, structureless band" in the red, yellow, and green, but "not extending further than wave length 0.67 μ toward the red end of the spectrum, nor than wave length 0.51 μ toward the violet end."

Prof. F. A. McDermott, writing on the recent investigations in this field, says, "Even if we should discover the means by which the fire-fly produces its light, we should hardly care to use it in our homes. The insect has, indeed, reached the highest possible radiant efficiency, but it has been accomplished at a sacrifice of color variety that makes the light worse for color effects than even the ghastly green of the mercury vapor arc. Anything not within a very limited range of yellow and green tones would appear black."

In Cuba and Central America the *Cucuyo*. — a large beetle, — is said to be more brilliant than any of our fire-flies. In the Bay of Bengal there is a spider "which shines like a star" — all of its legs, as well as its body, being radiant. Cuttle-fish and other marine monsters also carry lights.

Various theories have been advanced to explain these lights. At first it was thought that phosphorus had something to do with the phenomenon. This was, however, soon shown to be untenable, as the luminous tissues contain no phosphorus. It is now believed that a slow and peculiar form of oxidation is the true cause of the light. But its innermost nature has not yet been discovered. Together with the question, "Of what use is the light to the fire fly?" this query must remain unsolved until some definite reply be forthcoming, — as the result of newer researches and experiments.

Pilgrims New Monument. Pres. William Howard Taft, on 5 Aug. 1910, dedicated the monument erected at Provincetown, Mass., to commemorate the first landing of the Pilgrim Fathers on American soil, and the signing of the first civil compact in the cabin of the *Mayflower* as she lay in Provincetown harbor.

The monument is a strikingly beautiful tribute to the memory of the original settlers. It is constructed of granite, the approximate weight aggregating 11,000,000 pounds. Resting upon a reinforced concrete hill, it is — with the exception of the famous Washington Monument — the tallest monument of solid construction in the United States. The hill upon which it stands is 90 feet high, while the height of the shaft itself is 250 feet.

At the dedicatory exercises the bronze memorial tablet, inserted in a sunken panel over the south door of the monument, was unveiled by Miss Barbara Hoyt, the tenth in descent from Elder Brewster. The inscription on this tablet was written by Charles E. Eliot, presi-

dent emeritus of Harvard University, and reads as follows:

'On Nov. 21 1620, the *Mayflower*, carrying 102 passengers, men, women, and children, cast anchor in this harbor, 67 days from Plymouth, England. On the same day the 41 adult males in the company had solemnly covenanted and combined themselves together into 'a civill body politick'. This body established and maintained on the bleak and barren edge of a vast wilderness a State without a king or a noble, a church without a bishop or a priest, a democratic commonwealth, the members of which were 'straightly tied to all care of each others' goods and of the whole by everyone. With long suffering devotion and sober resolutions they illustrated for the first time in history the principles of civil and religious liberty and the practices of a genuine democracy. Therefore, the remembrance of them shall be perpetual in the vast republic that has inherited their ideals.'

On a clear day the monument will be visible for 40 miles at sea.

Pillars of Fire. See PENTECOSTAL UNION CHURCH

Pinchot, Gifford, American forester: b. Simsbury, Conn., 11 Aug. 1865. He was graduated from Yale University A.B. 1889; A.M. 1901; and received the honorary degrees of A.M. from Princeton University in 1904; Sc.D from Michigan Agricultural College in 1907, and LL.D from McGill University in 1909. He studied forestry in France, Germany, Switzerland, and Italy, and in Jan. 1892, began the first systematic forest work in the United States, a law having been passed in 1891, authorizing the President to set apart forest reserves. In 1892 he undertook the first practical task in forestry on any considerable scale in the United States at Biltmore, N. C., and later he opened an office in New York, as a consulting forester. Previous to 1905 the Bureau of Forestry merely gave expert advice on request to the Department of the Interior concerning the application of the science of forestry to the forest reserves, but in 1906 the name was changed from forest reserves to national forests, and the care of the administration of these national forests was given to the Bureau of Forestry. Mr. Pinchot was elected a member of the National Forest Commission in 1896, and, 1 July 1898 became forester and chief of the division of Forestry in the Department of Agriculture, which name was changed to the United States Forest Service, 1 Feb. 1905. He was chosen professor of forestry at Yale University in 1903; went on a tour of inspection to the Philippine Islands in 1902, and recommended a forest policy for the islands. He was appointed a member of the committee on the organization of government scientific work in 1903; of the committee on public lands in 1903; of the committee on department methods, in 1905; of the Inland Waterways Commission, in 1907, and of the commission on country life, in 1908. On 8 June 1908, he was appointed president and chairman of the joint committee on conservation, by the conference of governors and national organizations, held at Washington in Dec. 1908. He is a fellow of the American Association for the Advancement of Science; a member of the Society of American

Foresters; the American Forestry Association; the Royal English Arboricultural Society; the American Museum of Natural History; the Washington Academy of Sciences, and the Engineers and Biological societies. He is the author 'The White Pine' (with H. S. Graves, 1896), 'The Adirondack Spruce' (1898); 'A Primer of Forestry' (in Part I, Bulletin 24, of the Division of Forestry, 1899). President Roosevelt, during his administration, set aside 148,346,924 acres of forest reserves, and in Jan 1911 their area was 192,931,197 acres. Mr. Pinchot was an exponent of forest conservation and a controversy arose between him and Richard A. Ballinger, then commissioner of the General Land Office, at Washington, the bitter dispute resulting in Mr. Pinchot resigning his office as head of the Forest Service in 1910. See BALLINGER-PINCHOT CONTROVERSY.

Pineapple. For some considerable time, it has been known that the pineapple is good for sore throats of all kinds,—its juice being antiseptic and germicidal, to some extent. Only recently, Dr. B. G. R. Williams, of Paris, Ill., has asserted his belief that the pineapple will prove a great utility, and will be very extensively employed therapeutically and medicinally. It has been found of great benefit, he says, in sore throat, quinsy, tonsillitis, and nearly all other affections of the throat; some cases of dyspepsia, indigestion, and other gastric affections; boils, wounds, sores, and inflammations generally.

The pineapple is really a spurious fruit, or rather a collection of berries, each corresponding to a flower; under cultivation they are seedless. A pineapple taken at the end of a meal materially aids digestion by yielding a proteolytic ferment capable of converting albuminoids into peptone; the juice, in doses of a tablespoonful or more, is very beneficial in cases of chronic bronchitis, attended by the secretion of tough and tenacious mucus.

The juice of the pineapple contains about 2 per cent sugar, 1 per cent free acid, 3 per cent albuminoids and peptinous substances and 94 per cent water. There is a high percentage of mineral salts. The active principle of the fruit, ananisine, may be very properly considered a vegetable counterpart of the gastric juice, since, as discovered by Señor V. Marciano, the juice of the ordinary pineapple possesses the power of digesting proteid vegetable and animal substances. Chittenden, who, with others, followed up the investigations, found, in addition, that this digestant is active with either acids or alkaline carbonates, and that the ferment, to which the name "bromelin" has been given, is more nearly related to trypsin than to pepsin. The simple fact that pineapple juice will, for instance, digest beef, is most interesting from many points of view.

Pisa, Leaning Tower of. A paper dealing with the leaning tower of Pisa prepared during 1910 by Prof. William H. Goodyear, of the Brooklyn Institute of Art and Sciences, an archaeological expert of note and a particular student of this historic old shaft, advanced the interesting theory that the tower leans not by accident and settling of the earth, but by intentional construction of the builders. Professor Goodyear first carefully develops the theory of accidental settlement—that the tower began to settle soon after it was started

and, to overcome this, each story was built higher on the lowering side. The theory declares that, during the 170 years occupied in the construction of the tower, these corrections were made on every story, totalling 34 inches excess on one side over the other. Entirely outside of the fact that the Italian laws of the time forbade the construction of any building which had insecure foundations and ordered all those which began to lean torn down, Professor Goodyear asserts that no architects and builders would dare continue the construction of a tower which began to lean and progressed steadily in that way, since its ultimate fall would be plainly foreseen. Professor Goodyear spent a great deal of time investigating the spiral stairway of the tower. From his measurements of the steps he finds that the counteracting of this leaning tendency by building higher on one side and so shifting the weight to throw the centre of gravity is evident in the 13th step. If the leaning were accidental, Professor Goodyear declares, before the first step had been completed the leaning could not have been evident to the builders. From this premise Professor Goodyear develops his theory of the intentional leaning of the tower—a theory which has elicited a great deal of interest from experts in archaeology, the world over.

Pitman, Benn. American pioneer in the science of Phonography: b. Trowbridge, Wiltshire, England, 24 July 1822: d. Cincinnati, Ohio, 28 Dec. 1910. He was educated in Trowbridge, and in 1837 assisted his brother, Sir Isaac Pitman, in perfecting and compiling text books on phonography. He taught in his brother's academy and lectured on the shorthand system throughout Great Britain, 1843-52. In 1853 he came to the United States and lectured and taught phonography in Philadelphia, Pa., and in Dayton, Ohio, finally establishing the Phonographic Institute in Cincinnati, Ohio, and becoming its president. In 1867, with Dr. J. B. Burno, he succeeded in producing stereotype plates by the gelatine process in photo engraving. He was official stenographer during the trials of the plotters against the life of President Lincoln, the Sons of Liberty, and the Ku Klux Klan, and edited and compiled the reports. He lectured on art and taught artistic wood-carving at the School of Design, now Art Academy of the University of Cincinnati. Mr. Pitman was an exponent of simplified spelling, and for years had worked on an alphabet which would eliminate the letters c, q, and x, which he considered superfluous. Among his writings are 'Reporter's Companion' (1854); 'Manual of Phonography' (1855); 'History of Shorthand' (1858); 'A Plea for American Decorative Art' (1895); 'A Phonographic Dictionary,' with Jerome B. Howard (1901); 'Sir Isaac Pitman's Life and Labors' (1902); and 'A Plea for Alphabetical Reform' (1905).

Pittman, William P. American soldier of fortune: b. Cambridge, Mass., and engaged in business as an electrical engineer. He was employed on the Panama Canal, where he met Carlos Charrmorro, brother of Gen. Emiliana Charrmorro, the leader of the revolutionary forces of Nicaragua, and learning from them that President Madriz, of Nicaragua, was treating the people of the republic as a despot, he

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decided to join the Revolutionary army, and serve as an electrical engineer. He joined a force of revolutionists on the frontier of Costa Rica, and served from March 1910 to June 1910, when he was captured at Rama, not far from Buefieds. He was taken to Castillo on the San Juan River, where he was imprisoned in a narrow, evil-smelling cell until 2 July, when he was transferred to the prison at Managua, where, through the interposition of the American Consul, José de Olivares, he received decent treatment, and when Madriz's party was defeated he was liberated. He won the title of colonel in the Nicaraguan army, and was given a position under the new provisional President of Nicaragua, Juan Estrada. Pittman returned to his home in Boston on 11 Dec 1910, to visit his family, but went back to Nicaragua to look after his interests there.

Pittsburgh, Pa. According to the 1910 census, Pittsburgh is the 8th city in point of size in the Union, and has a population of 533,905, which is a gain of 18.2 per cent over 1900. The area of the city is 40.23 square miles, and it has 983 miles of streets, of which 508¼ are paved. The average annual death rate is 14.50, and the births, 24.30. The assessed valuation of the real and personal property is \$751,226,965, and the tax rate is 7.50. The net public debt is \$27,638,063, and the annual cost of the city government, \$14,025,996, of which \$1,997,194 is spent for schools, having 57,215 pupils and 1,423 principals and teachers, \$864,018 for the fire department, with its membership of 724, and \$1,100,000 for the police, composed of 776 men, whose annual arrests average 35,000. The water works are owned by the city, the cost being \$25,000,000. There are 693 miles of mains and the average daily consumption of water is 110,000 gallons. The daily capacity is 140,000,000. The annual cost of lighting is \$130,467 for gas, and \$278,733 for electricity. Pittsburgh has 542 1.5 miles of sewers, and spends \$399,353 for street cleaning. The first Mayor of Greater Pittsburgh, which is composed of the old city of Pittsburgh and Allegheny, was elected in 1909. The city is the headquarters of the United States Steel Corporation. It is also the largest producer of steel rails and armor plate in the United States. It has an enormous output of iron and steel products, and also of glass table ware, and plate and window glass. The largest manufactory of cork in the world is in Pittsburgh. It also has the largest pickling and preserving establishment. The latter comprises nine factories, gives employment to 2,800 hands, and uses the product of 18,000 acres of vegetable farms.

Plague. The recent presence of plague in San Francisco has again called attention to this ever-present pest, and has shown us that, if suitable conditions be given, it will appear in the most civilized of countries, in the heart of modern culture. The manner in which it was stamped out, however, shows us that this scourge of mankind could never attain the proportions once reached; that it can now be limited to certain small areas, and stamped out before it has grown far beyond all barriers. This much, at least, we owe to modern science, and the discoveries and inventions of medical research. In India, too, rapid progress is being made in wiping out this national men-

ace; and there is every reason to hope, that, with the progress of medical knowledge, and the improved hygienic conditions of the people, it will not be many years before this disease, which has afflicted man for so many centuries, will be entirely removed.

Plague has been defined as "a specific contagious and infectious febrile disorder, characterized by extreme mental and physical depression, generally attended by hæmorrhages in different parts, bubonic swellings in one or more of the glandular regions, and, occasionally, by involvement of one or more of the other systems (especially the respiratory, central nervous, and cutaneous); a disease, though reputed to be endemic in some areas, occurring generally, at long intervals, in epidemic or pandemic form." Jennings, 'A Manual of Plague,' London, 1903.)

Much mystery always surrounded this disease; and it is only within a comparatively short time that its true nature has become apparent. It is now known that the disease is due to the presence and activity of a certain bacillus. It is usually from .8 to 2 mm. in length, and from 8 to 4 mm in breadth. The width is usually about half the length; but they are often irregular in shape, particularly in post-mortem cases. Often they are found to occur in strings,—several being joined together. They are prepared and studied by several processes—various dyes being used. Of these, the following are the most important cultures: Agar-agar; gelatine; and bouillon. They differ in appearance according to the culture employed.

Circumstances which have been found to be unfavorable to the growth of the plague bacilli are: Excessive heat or cold, circumstances which favor dessication, light, efficient ventilation, chemical disinfectants, etc. Favorable conditions are, needless to say, all unclean and unhygienic conditions, personal, and public.

Susceptible animals to the plague, besides human beings are: Rats, squirrels, mice, monkeys, cats, and guinea pigs. The latter only contract the disease if kept in confinement.

The bacillus enters the body either through the skin or mucous membranes. Of these, entrance by the skin is by far the most frequent. When it has once entered the blood-stream, it invades any part of the body.

Recent researches have shown us that certain predisposing causes favor the onset of the plague. Of these, contact is the chief factor; others are environment—climate; locality, and hygienic conditions generally; and personal factors, such as age, sex, race, occupation, temperament, heredity, habits of life, etc.

As to the treatment employed, much work has been expended of late years in a study of this disease, and attempts to find a serum which will be efficacious; so far, however, without decisive results. Two of the most important sera that have been tried are those of Yersin and Lustig—both of which were obtained by a complicated process of injections in animals. The sera thus obtained were tested by the Indian Plague Commission with a view to determining the presence of anti-bacterial substances. The methods they employed were: (a) The mixing of the sera and the bacteria against which they were to be tested *in vitro*,

for ascertaining whether the morphological structure or disposition of the bacteria was in any way altered by the serum; (b) the cultivation of the bacteria on the sera; (c) the introduction of the sera, within a measured quantity of the corresponding bacteria, into the peritoneal cavities of normal animals for testing the presence or absence of specific antibacterial substances by examining portions of peritoneal fluid, withdrawn at different intervals, with a view to ascertaining whether the incoporeal bacteria had been spherulated or dissolved; and (d) the testing of the therapeutical result of the sera on animals infected with plague.

The results of the first three methods are thus recorded by the Royal Commission.

"In the case of the samples, both of Yersin's serum and of Lustig's serum, which were examined by us, we were quite unable to detect anything in the nature of agglutination or morphological alteration in the plague-bacteria which were brought in contact with the diluted or undiluted serum. These observations, however, are not conclusive as to the absence of agglutinins, for, as explained elsewhere, the presence of agglutination can hardly be demonstrated with cultures such as those were using, in which plague bacteria are already *ab initio* agglomerated together.

"Further, we were unable to satisfy ourselves by cultivation methods of the presence of any anti-bacterial substances in the serum. Plague bacteria were cultivated in Yersin's and Lustig's serum, and on mixtures of those sera, and ordinary nutrient broth; and these cultures were, so far as could be judged, no less luxuriant than those which were made upon normal horse-serum and nutrient broth respectively.

"Further, we added the serum in different proportions to fresh cultivations of plague bacteria, and we inoculated these mixtures into the peritoneal cavities of normal guinea pigs, with a view to determining whether the serum would, in presence of the non-specific antibacterial substances which are contained in the normal peritoneal fluid, exert a spherulating or bacteriolytic effect. Here, again, our results were purely negative. We saw nothing that reminded us even in the remotest degree of the striking results which obtained when cholera bacteria were introduced into the peritoneal cavity in association with the serum which contains the corresponding specific antibacterial substance."

As regards the last method, the committee reports that "the administration of Yersin's serum did, when administered to guinea pigs, exert a well-marked effect in the direction of protection." The most that could be obtained by this treatment, however, was to postpone the time of death; and in no case was death actually prevented.

Very similar results have been obtained in the case of other sera tried. In no case has there been found a serum capable of preventing death with the same surety that sera do in other diseases. The conclusion reached by the committee was as follows: "All that can be pronounced at present, therefore, is that the results of the experiments are encouraging, and give grounds for hope that this system of treatment—the only rational one for a specific

disease—may, by gradual improvements in the method of preparation and application of the serum, lead to a substantial reduction in plague mortality."

England has recently had quite a popular "scare" regarding the plague, as several rats have been found infected with plague,—they having been brought to the country on vessels coming from Indian ports. They came ashore across the gang planks, as they usually do; but now the hawsers of all ships moored at the quay-side are fitted with a device which intercepts rats; and in other ways prompt steps were taken against the danger of infection from rats.

The result is that rats have been killed in England in thousands,—ferrets being employed for the purpose, as the rats must not be allowed to die, as they would were they poisoned. The eating of rabbits, hares, and nearly all ground-game ceased for some time. A conference of representative medical men was called from all over Great Britain to decide upon the measures to be taken. Orders were given the farmers to cease killing the ferrets, as they were to be employed for killing the rats.

In China the plague entered and spread with fearful rapidity during the last months of 1910. The affliction was fearful, nearly 3,000,000 persons being plague-stricken in the province of An-Hui alone. The ravages of the plague at Mongolia were long unchecked,—there being no adequate medical attention by Chinese physicians, and the Russians were afraid to expose themselves to the infection, in this and other districts. Corpses frequently marked the sites of abandoned camps of nomads. In Manchuria, too, the situation was most grave. The German Consul at Harbin even notified the Chinese Taotai that Germany would act unless some radical measures were taken to stamp out the pestilence. The Municipality of Harbin invited the Japanese physicians to attend their sick, as no other means of relief was in sight. It is stated that between 2 October and 11 Dec 1910, 482 Chinese and 11 Russians were stricken in the city; and 481 Chinese and 10 Russians died within the precincts of the Eastern Chinese Railroad. From these figures, it may be seen that the situation was most appalling. It was doubtless increased, also, by the carelessness of the people; and by the general lack of medical care.

Planetary Life. See ASTRONOMY.

Planets. See ASTRONOMY.

Plant Breeding. See HORTICULTURE.

Plant Industry, Bureau of. The Bureau of Plant Industry, a branch of the organized work of the United States Department of Agriculture, continued its studies of plants in all their relations to agriculture throughout the year 1910. Many important discoveries resulted from the work of this bureau. The crown-gall of cultivated plants was shown to be cross-inoculable to an astonishing degree, galls having been produced on various species belonging to widely different families by pure-culture inoculations with *Bacterium tumefaciens* isolated from the Paris daisy. This organism was inoculated successfully many times into the peach, rose, hop, sugar beet, white poplar, and

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other like susceptible plants. Successful cross-inoculations were also obtained with the organisms isolated from the crown-galls of man, other plants. A destructive tumor disease of limes and other citrus fruits was shown to be of fungous origin and to attack not only limes, on which it was first observed, but oranges also, while artificial infections were produced on pomelo, lemon, and *Citrus irritans*. Mycelium was also traced on the stem from one to two feet beyond any external sign of infection. An extensive study was made of the bud-root of the cocoanut palm, which has caused enormous losses. The cause of the disease was determined and extensive experiments carried on with a view to its prevention and eradication. Considerable work was also done during the past year on a new spot disease of cauliflower. The cause was determined, a biological study of the parasite made, and many experiments carried on to determine the conditions under which infection takes place. Studies were also made of the bacterial and fungous content of spoiled maize; the interrelation of crown-gall organisms; the new and destructive Grand Rapids tomato disease; banana diseases; and of all sorts of bacterial diseases of plants. These will be continued throughout 1911.

The new methods of spraying with sulphur compounds worked out by the pathologists of the bureau were widely adopted during 1910 by apple growers. The investigations showed that fine fruit can be produced and protection secured against fungous diseases without the injurious effect resulting from the use of copper compounds. The fruit-spot and leaf disease known as cedar rust or orange rust of the apple had the worst outbreak ever known in 1910 in the Blue Ridge and Allegheny Mountain districts, and the bureau here obtained an opportunity to demonstrate for the first time that the disease, although it has not heretofore proved amenable to spraying, can be prevented by that means if application is made just before the general infection. Through the Bureau of Plant Industry's efforts boiled lime-sulphur was largely used as a fungicide in the spraying of the peach for brown-rot and scab, with the result that those diseases greatly decreased during the year. On the Pacific coast the work of controlling pear-blight by eradication methods was successfully carried out, while it was demonstrated in the same section that the powdery mildew of the apple can be satisfactorily controlled by spraying. Experiments in spraying for pecan scab were meanwhile continued in South Carolina, and similar experiments started in Georgia. Though this disease can be controlled by spraying it was shown that it is desirable to avoid that process by the use of resistant varieties of pecans.

The bureau also conducted extensive studies in forest pathology. The chestnut-bark disease spread during 1910 to northern Massachusetts and New York, western Pennsylvania, and eastern West Virginia, but the department showed that in the case of young ornamental trees and orchard trees this disease may be controlled by a cutting out and pruning system, although this method is impracticable with large ornamental trees or forest trees. The bureau destroyed all the white-pine seedlings diseased with blister rust which were

found in 1910. These appear to have been imported into some 230 localities of North America, but it is more than probable that the department was unable to discover all the importations so diseased. This disease affects mature trees as well as nursery stock, and occurs not only on the white pine, but on the sugar-pine, the western white pine, and probably all other five-needled pines. The Bureau of Plant Industry favors the absolute prohibition of the importation of all white-pine seedlings, since the harm which this disease can do, if it once gains a firm foothold in this country is out of all proportion to the value of all white pine seedlings ever imported or likely to be. Data collected in the forest-disease survey indicated that in America timber decay and tree disease are second only to forest fires as causes of loss. In theory it is easy to remove diseased trees in the forest when cuttings are made, leaving only healthy specimens for seed trees, and so continually improve the health of the forest; but in actual practice so many questions of economy and differing local conditions are involved that many difficulties must be overcome. The bureau lays great emphasis on the fact that a great deal of attention must be given to working out this problem. Bureau experts will undoubtedly devote much time to its solving during 1911.

The growing of cotton and cowpeas has been greatly retarded on farms by the recent spread of wilt and root-knot, so that the problem now before the Bureau of Plant Industry is to reach farmers with new seed of wilt-resistant varieties. The bureau began this work in 1910 and will greatly extend it throughout the following year. The year 1910 also brought to light a rust-resistant asparagus, which was speedily propagated by the bureau. Attention was also paid to diseases of the potato, particularly on account of the outbreak of several new potato diseases in many foreign countries. These are liable at any time to be introduced into the United States, unless protective measures are taken. The harm which would result from such a condition is almost inestimable, and the bureau strongly urged Congress to authorize the Secretary of Agriculture to prohibit the entry of diseased plants and seeds into this country. A campaign to increase the yield of sugar beets was also undertaken, and as a result the indications are that the quantity grown in this country will increase greatly in the future. See SUGAR BEET.

Several new types of Upland cotton were introduced into Texas during 1910 through the efforts of the bureau, all of which give promise of becoming important factors in the cotton industry. At the same time work was carried on in the local adjustment of cotton varieties, while extensive experiments in Texas, Kansas, Arizona, and California show that there are possibilities of a much more extended cultivation of cotton in this country than has ever been imagined.

In the matter of drug-plant investigations, the camphor work made considerable progress during 1910, the area of camphor planted as a result of private enterprise increasing at an encouraging rate. The paprika-pepper crop increased in size during 1910, and the hop work of the bureau was directed toward the improvement of varieties and toward better meth-

ods of handling the plants in the field. Work on tanning crops was continued on a small experimental basis. Tea work was continued in South Carolina, with the result that the demand for American-grown tea greatly increased, while investigations with regard to perfumery-plant and volatile-oil showed that many of the foreign plants used for purposes of volatile-oil production can be grown and distilled satisfactorily in this country. The bureau divided the field work on poisonous plants into two types (1) Feeding experimentation, carried on at a temporary station at Mount Carbon, Colo., and (2) reconnaissance work, carried on wherever complaints of considerable losses seemed to demand attention. In connection with the reconnaissance work much attention was paid to trouble in the national forests, and under both divisions important discoveries were made, while laboratory studies in this connection were directed toward a variety of subjects, most important of which was probably the loco-weed problem.

Among the various technological problems carried forward by the bureau during the year the work of cotton grading was prominent. In accordance with the act of Congress nine official grades of white American cotton were promulgated. Twenty-five sets of these types were carefully prepared for storage in vacuum for the purpose of comparison in future years. Investigation of the length and strength of cotton fibre was actively prosecuted and great progress made, while the problems of cotton marketing received further study in the field. Technological work on crop plants which may be used for paper making was also carried on, strikingly favorable results being obtained from broom-corn stalks which, combined with an equal quantity of poplar pulp, are suitable for immediate use in paper making. The pulping of cornstalks did not prove so satisfactory, but good qualities of paper were produced from numerous varieties of corn. The fibre investigations of the bureau paid special attention to hemp, flax, and sisal. Hemp grown in Wisconsin in 1909 was retted and broken, and the fibre sold to manufacturers at very satisfactory prices. The work with flax was conducted with a view to developing uniform varieties, and attention was also devoted to an increased production of flaxseed to meet the growing demand for this seed in the manufacture of linseed oil. Sisal, henequen, and zapupe plants, cultivated in cooperation with the Porto Rico Agricultural Experiment Station and the Porto Rican Government, made a very satisfactory growth.

With the object of improving general market conditions, the Bureau of Plant Industry undertook during 1910 a scientific study of the commercial conditions which affect the grain crops after they have been produced, including studies of the methods employed in harvesting, storing, transporting, grading, and marketing. Extensive experiments along these lines were carried on with regard to corn and wheat. At the same time the seed-testing laboratories of the bureau in Nebraska, Missouri, and Oregon were hard at work, while new laboratories were opened during the year in coöperation with the North Carolina Department of Agriculture and the Purdue University Agricultural Experiment Station. The seeds were

examined for the presence of adulterants, and, as formerly, the names and addresses of all dealers who offered for sale adulterated seeds were published, with the result that fewer lots of adulterated seeds found their way onto the market in 1910 than in any previous year on record. Elaborate grain investigations were also conducted, including studies in winter-wheat extension, durum wheat, Chul and Fretes wheats, crops in rotation with cereals, time and rate of seeding grains, dry-land grain, grain-sorghum, rice, oats, barley, cereal disease, and, in the Southern States, corn and tobacco. Meanwhile physical measurements were made of all the dry-land experimental farms to determine the methods of cultivation which are most effective in conserving soil moisture and the amount of water required by the different crops. The bureau also operated field stations, where experiments were made in growing a variety of rare grains and fruits, at almost all the Reclamation projects in the Western States. Investigations were meanwhile carried on in alkali and drought-resistant plant-breeding, re-seeding the denuded mountain grazing lands, truck crops, and the date, fig, and blueberry cultures. Extensive field investigations in pomology were prosecuted, together with viticultural investigations, and inspirational work in connection with greenhouses, gardens, and grounds. Great progress was made in the introduction of foreign plants into this country by the Bureau of Plant Industry, while investigations in farm management were conducted in all quarters of the United States, instruction in this connection being given in organization and operation, while the farmers' coöperation demonstration work was continued with great benefit to all who came in touch with it. Progress was also made in forage-crop investigations, and a great deal of work done in breeding improved forage crops. The distribution of seeds and plants upon Congressional order was continued by the bureau during 1910 along very much the same lines as in the preceding years, and was attended with the former encouraging results.

Plant Intelligence. See BOTANY.

Plate Glass Insurance. See INSURANCE, CASUALTY.

Platt, Thomas Collier, American politician: b. 15 July 1833, at Owego, N. Y.; d. 6 March 1910. He joined the class of 1853 at Yale University, but owing to ill health did not graduate. He nevertheless received the degree of A.M. when 43 years of age. He was president of the Tioga National Bank, and engaged in the lumber business in Michigan until 1859, when he became Clerk of Tioga County. From 1873 to 1877 he was a member of Congress. He was elected United States Senator 18 Jan. 1881, but resigned in May of that year, as did also Senator Conkling, because of a controversy with President Garfield concerning political appointments.

Senator Platt was made Secretary and Director of the United States Express Company in 1879, and its president in 1880. He was president of the board of quarantine commissioners of New York, from 1880 to 1888, and also president of the Southern Central Railroad and of the Addison & Northern Pennsylvania Railroad. He was reelected to the United

PLAYGROUNDS

States Senate in 1897, continuing until the expiration of his term, in 1909 'The Autobiography' of Thomas Collier Platt' was published in Oct. 1910, and gives accounts of many stirring political events of the 53 years of his active career.

Playgrounds. Playgrounds for children have been constantly increasing in number and area in the United States since the beginning of the movement. In 1907 the number of cities maintaining supervised playgrounds was 90; in 1908 it was 177, and in 1909, 336, while on 1 June 1910, an additional number of cities to the number of 195, were conducting playground campaigns. In 1909, 1,535 playgrounds in all were maintained. Within the past five years 70 local playground associations have been organized. There are now 20 playground commissions, five of which have been organized since Dec. 1909.

The total amount of money spent for playgrounds can be given only approximately, but the average amount spent by each city was more than \$7,000. New York spent 4 cents per capita for her playgrounds; Chicago, 29 cents; Baltimore, 9 cents; Pittsburgh, 7 cents; East Orange, N. J., 35 cents. Reports sent in by the cities regarding the number of play leaders employed, showed 259 cities employing in all 3,756 play leaders.

Throughout the country land for this purpose has been given or lent by various owners. One of the playgrounds given in Philadelphia was valued at \$60,000. Fraternal clubs, churches, colleges, and business houses, as well as private individuals, have given and loaned playgrounds. The Treasury Department at Washington has decided to allow unoccupied building sites which the government owns to be used for playgrounds, and 138 such sites are available until such time as the money for the buildings shall be appropriated by Congress. In Colorado, the Board of Land Commissioners decided to grant from 2 to 5 acres of land for playground purposes to any district school-board agreeing to spend an amount for apparatus and equipment, which the State superintendent of public instruction shall approve. The prisoners in a Chicago workhouse volunteered to aid in the grading of a public playground for which no money was available. Several large department stores have added playgrounds to their equipment, and one firm employing hundreds of workers in different cities employs a man at \$3,500 a year to take charge of the children's recreation. Bond issues are under consideration in several cities to provide sums ranging from \$200,000 to \$700,000 for this purpose.

The importance of the play leader was early recognized. In many small cities the problem of parents is to keep children and young people from seeking the wrong sort of amusements. In many factory towns the need of play for the children is considered of too little importance, and the interest of the people must be awakened. The personality of the play leader is more important than the material equipment of the grounds, for, obviously, to throw all sorts of children into a playground without direction is to open the door to all sorts of dangers. The work of the play leader varies with the community under consideration. A part of the work is the conservation of old and

interesting forms of play, teaching them to new generations of children and bringing out the physical and mental benefits to be gained from such organized play. The folk dances and games of the Old World often receive attention in such communities as are largely foreign. In Boston some attention is given to utilizing the natural dramatic instinct of children in impromptu acting of fairy tales and historical events, with such stage properties as they themselves can easily make. Everywhere, of course, simple gymnastics and vocal instruction are part of the benefits of the playground, and the children, in this flexible organization, are taught to act in an orderly and disciplined way in play as in work.

There is, moreover, a growing conviction that the play centre fails of its larger duty if it does not develop a spirit of play which makes every home a play centre. The home must ultimately be the centre of play, and the training of millions of children in games and exercises which interest, instruct, and tend to healthful life means a new generation of mothers who will know how to make home a centre of happiness for their children. As one of the leaders in the movement put it, "A funeral should not be the only occasion in which the whole neighborhood gathers for an evening in the home of one of the neighbors." To teach this play spirit, to give the children a natural and lively interest in what belongs to their years, is to prevent precocious knowledge of the more vicious aspects of life. The playground is one evidence of general recognition of the fact that what a child seeks is the story, the drama, the sensation, and movement of living, and that when this is furnished in a wholesome form it will be more interesting and absorbing than less healthy interest in the affairs of older people.

The general interest in playgrounds and supervised play has been shown in a multitude of ways. Nearly every newspaper is enthusiastic on the subject. The National Convention of the Women's Trade Union League advised local organizations to work for play centres. Many mayors in their inaugural addresses have given special attention to the subject. In places where the political parties would not take up the playground question at all, the playgrounds have nevertheless been established.

The children themselves have joined in the movement. In Stockton, California, 4,000 children marched to the City Hall to ask the city fathers not to forget their playground. 3,000 children of Camden, N. J., did the same thing, and presented petitions signed by thousands of citizens. The president of the common council moved that bonds be issued to the amount of \$250,000 to secure the land desired for playgrounds and parks. The newsboys in Kansas City arranged a ball game to raise money for a playground. It is hoped that before 1915 every city and town in the United States will have supervised playgrounds for the children.

The necessity of trained play leaders, and also the need that teachers and other social workers shall secure a better knowledge of the question, have led to the arrangement of a Normal Course in Play. The following institutions among others are using this course:

PLAYGROUNDS — PNEUMONIA

Summer school of Columbia University, New York, summer school of Harvard University, International Y. M. C. A. Training School at Springfield, Mass., Leland Stanford Junior University, University of Chicago, University of Rochester, State Normal Schools of Colorado, Michigan, Nebraska, and North Dakota, Universities of California, Wisconsin, Missouri, and Rochester.

The Playground Association has about 1,000 photographs with sets of lantern slides, which it uses in local campaigns. This association assists the various play centres to secure competent directors, and is the source of information on the general subject of playgrounds.

Where playgrounds have been established they have been placed under the general charge of whatever local authorities seemed most fitted for the work. Park commissions, school boards, women's clubs, Young Men's Christian Associations, civic leagues, neighborhood associations, a federated brotherhood of twelve churches, associated charities boards, and various other associations, committees and councils furnish the managers. The sources of support include city appropriations, private donations, subscriptions, club funds, park commission funds, Health Department funds, private corporations, and memorial funds established by wealthy men and women to perpetuate the name of some relative. In some cases \$50 or \$100 of the funds for the season's work are derived from one of these sources, and the rest from public appropriations. The expenditure, in 1909, ranged from \$123,000 in New York, \$55,000 in Boston, \$55,000 in San Francisco, \$31,000 in Syracuse, N. Y., \$500,000 in Chicago, \$45,000 in Baltimore, \$30,000 in Philadelphia, to such sums as \$75, \$50, and even \$20 and \$10 in some of the smaller towns.

Every year there is a Play Congress, at which special committees submit reports on the following subjects: Activities for girls, athletics for boys, equipment of playgrounds, festivals, folk dancing, legislation favoring playgrounds, a normal course in play, the organization and administration of a playground, playgrounds in relation to other social centres, play in institutions, recreation buildings for large and small communities, statistics, and storytelling. Inquiries as to the movement are constantly coming in from all parts of the United States, and also from the Philippines, Porto Rico, Panama, South America, Canada, and Europe.

The general movement may be classed as one of those which are growing out of the thought that city folk must have the city made to suit their needs in order not to be shaped by the city in defiance of their needs. For many generations the average child in this country had freedom to play out of doors in the grounds about his home. With the gravitation of the populace toward cities this has largely ceased to be possible, and the percentage of country-born and village-born among native Americans is so large that any movement tending to secure their children room to play was practically assured of success from the beginning. In relation to this movement is also the tendency toward normal physical development in schools, which is made possible only by properly supervised and directed play. The history of all the world's great cities has shown

that the city tends to eat up vitality and breed a race of men inferior in physique to the country races. The object of the playground movement is twofold, to counteract this tendency in city children, and provide them with the wholesome recreation they need for development, and on the other hand, to make the life of the country town agreeable and attractive by training the children in the art of amusing themselves and organizing their own forces to take advantage of the pleasures at hand. This unique movement is American, but may end in being world-wide.

Plows, Snow. See SNOW PLOWS

Pneumonia. Although pneumonia has been known for many years, it is only within the past three or four that it has attained its present degree of fatality. During the past year or two, there seems to have been a sudden increase in deaths from this disease. More than 70,033 deaths occurred in the registration area of the United States during the past year — which is 9,000 more than occurred in 1908. The number of deaths during the past year, from pneumonia, is greater than from any other single disease, with the exception of tuberculosis. The number of deaths due to pneumonia grew from 136 per 100,000, in 1903, to 70,033, or 143.6 per 100,000 population, in 1909, — the latter number being only seven less than the number, 70,040, from tuberculosis of the lungs. The rate in both years was higher than for any previous year of the decade.

While pneumonia is a germ disease, the actual onset of an attack appears to be determined largely by other factors. The pneumonia commission showed that the mouths and throats of a large part of all the New Yorkers examined contained pneumococci. They appeared to do no harm until a certain change of condition rendered them virulent. Whether this change is a mere matter of lowered bodily vitality and weakened resistance, or the result of some specific alteration remains an open question. It can hardly be doubted, however, that the bad ventilation which is one of the worst features of our winter life plays some part of the problem. It seems possible that the subways also play a part in the production of the disease. At all events, the open-air treatment is now gaining a wide following, — in opposition to the closed-in rooms which, until recently, have been prescribed, — as they were years ago in cases of consumption.

The germs of pneumonia will resist the action of direct sunshine for an hour or more, even when dried. Diffuse sunlight they can stand for a much longer time. It has been found that these germs can live, on occasion, as long as 55 days in the latter. The germ is found in the air passages, the blood, in the mouth, nose, and throat of pneumonia patients, even for months after recovery.

The usual mode of infection is by means of inhalation. The germ then finds its way into the general circulation — hence it is a general and not a local disease. It may be found in the heart, the spleen, kidneys, stomach, etc. In some cases, other microbes find their way into the blood stream, along with the pneumococci, forming what is known as a "mixed infection," and such cases are more frequently fatal than pneumonia itself.

POETRY AND POETS—"POLLY" TABLET

While the germ is the exciting cause of the disease, the state of the body is the predisposing cause, and it is, as yet, uncertain in what this consists. It has been found that the aged are more liable to die from the disease than younger persons—which is only what we should expect. Again, colored people are more likely than the white to suffer. Men are more prone than women. Winter is the time when pneumonia flourishes. Cold and wet are doubtless contributory causes, also the close rooms, when the doors and windows are shut, "to keep out the cold." Worry, fatigue, and all depressed states—bodily and mental—are predisposing causes. An excess of food is one of the most powerful and far-reaching causes,—though this is not generally known. Mal-assimilated food material is deposited by the blood in the tissue of the lungs, and it is the removal of this which constitutes the active symptoms of the disease. The pneumococci are instrumental in this.

The measures to be adopted to prevent pneumonia are simple, and much the same as those which will prevent consumption. Cleanliness, sunlight, freedom from dust, sobriety, a simple diet and not too much of it—these are the measures which, if followed, will prevent pneumonia as effectually as they prevent tuberculosis. There is no reason for the present high death rate from this disease; and if simpler rules of life were adopted, there is every reason to believe that a great reduction in the number of deaths would ensue the following year.

Poetry and Poets. Carmel-by-the-Sea, on the western slopes of the Sierras, at Monterey Bay, first the home of the poet Stirling, who wrote 'Testimony of the Suns,' has recently become a place of summer homes for several of the literati and artists of California. David Starr Jordan, the president of Leland Stanford Junior University; Arnold Genthe, an art photographer; Herman George Scheffauer, the poet, who wrote 'Of Both Worlds'; and Mary Austin, James Hopper, Herman Whittaker, all writers, live here, and from the East have come Upton Sinclair, Grace McGowan Cook, Alice McGowan, and Michael Williams. A course in writing poetry was established in 1910, at the University of Missouri, and is conducted by Dr. R. H. Miller. For several years a prize of \$100 has been offered for the best poem by an undergraduate without being won by any student. A poetry club was founded in March 1910, as a salon for poets, at the apartments of Mrs. Isaac L. Rice, at the Ansonia, New York.

Poindexter, Miles, American politician: b. Memphis, 22 April 1868. He was educated at Washington and Lee University, and in 1891 removed to the State of Washington. He was elected prosecuting attorney of Walla Walla County in 1892, and appointed assistant prosecuting attorney of Spokane County in 1898, serving for six years, when he became judge of the Superior Court. In 1908 he was elected to the 61st Congress, and in Jan. 1911 was chosen United States Senator.

Polar Research. See NORTH POLAR RESEARCH and SOUTH POLAR RESEARCH.

Police, Boy. See BOY POLICE.

Politeness, League of. In Dec. 1910 Berlin's new 'League of Politeness,' founded by

Fraülein Cecile Meyer, a German lady who resides in Rome, came formally into being. The organization, which aims to improve the manners of the people of Berlin, started with a charter membership of 2,500. Fraülein Meyer's ultimate aim is to establish leagues of politeness, whose object shall be the fostering and promoting of courtesy in all its phases, in all the great countries of the world notably in America, England, and France. Italy already possesses such an institution, which is there known as "Pro Gentilezza." Fraülein Meyer declares that there is no doubt that modern society is more or less impolite everywhere, but Berliners are so notoriously discourteous that she believed that city to be the most fit place for the inception of her international movement for the inculcation of better manners. The project enjoys the support of many very influential persons, and there appears every prospect that it will thrive. The members are all pledged to wear an emblem which is to act as a talisman not only to themselves but also to others who see it on them. It is intended to serve as a reminder to the wearer to be at all times polite in every way and at the same time indicate to persons who see it that they are dealing with a courteous individual. Fraülein Meyer says that Germany is by no means the only country where impoliteness and lack of good breeding prevail. America she accuses of being discourteous to a fault, although usually where some definite object, such as saving time, is at stake. She declares the courtesy of American men toward women to be more or less of a myth to European minds, tending only to spoil American women. Both the men and women of England Fraülein Meyer accuses of being uniformly discourteous, particularly in their attitude toward foreigners, while the French, she says, have long since forfeited their old-time reputation as an eminently polite race. All this the new organization which Fraülein Meyer has started is striving to change.

Pollock, Channing, American dramatist: b. Washington, D. C., 4 March 1880. He was graduated at Bethel Military Academy, Worcester, Va., in 1897 after which he took a course of study in dramatic art in the Polytechnique at Prague, Austria. He was dramatic critic of the *Washington Post* in 1898, and of the *Washington Times*, 1899-1900. He was press agent for Wm. O. Brady, the producer of dramatic plays, 1900-04, of Sam S and Lee Shubert, 1904-05. He then engaged in dramatic writing and became dramatic critic of *Smart Set* and *Green Book*. He founded and published *The Show*, a dramatic magazine 1904-06. He was admitted to membership in the Society of American Dramatists and Composers; contributed to magazines, articles on the drama and is the author of the following books: 'Behold The Man' (1900); 'Stage Stories' (1901); 'The Book of the Theatre' (1909); and of plays: 'A Game of Hearts' (1900); dramatized 'The Pit' (1900); wrote 'Napoleon the Great' (1901); dramatized 'In the Bishop's Carriage' (1902); wrote 'Little Gray Lady' (1903); dramatized 'The Secret Orchard' (1907); 'The Inner Shrine' (1909); and wrote 'The Traitor' (1908), and 'Such a Little Queen' (1909).

"Polly" Tablet. The *Polly*, which was a famous privateer in the War of 1812, and despite her age is not only engaged in coast-

wise trade, but is one of the fastest schooners of her size afloat to-day, was decorated with a bronze tablet on 2 Nov. 1910, by members of the New York Chapter of the Daughters of 1812. Resting at the pier at the foot of West 15th street in the North River, New York, the *Polly* was gaily dressed for the occasion from mizzen topmast to bowsprit and stern with flags and bunting. She is built along Dutch lines, a familiar type of naval architecture in the period to which she belongs. She still retains all her original planking which is of three inch oak, and her ribs are of oak with a thickness of 7 or 8 inches. Her quaint Dutch windlass is made of oak and solid iron. The tablet, which was put in the outside woodwork of the schooner's cabin, was unveiled by Mrs. Sybil H. Lincoln, a granddaughter of Capt. Judthan Upton, a commander of the *Polly* in the War of 1812. She exhibited the original log of the *Polly* to those present, among whom was Capt. George W. Homans of Brooklyn, whose uncle Jonathan Homans, was killed in an engagement abroad the vessel. The *Polly* was built in Amesbury, Mass., in 1805, and is 61 feet over all. She became a privateer in the War of 1812 and was owned and commanded by Capt. J. Upton, a noted seaman of his day. His ancestors were American revolutionists. He fitted out the *Polly* with two "Long Toms," which were trained over her stern and bow. Her crew of 20 men was armed with pistols and cutlasses. He sailed from Salem Harbor on 7 Dec. 1812, and two days later captured his first prize, a British full-rigged ship. He captured altogether 11 craft of the enemy. The *Polly* was finally captured by the British frigate *Phoebe*. When the case of *Polly* was tried before the British High Admiralty Court, Captain Upton proved that he brought the cargo he carried when captured from Havana and that the goods had been entered at the custom house at Marblehead. The court restored the cargo to the neutral claimants. After the war the *Polly* entered commercial life under the American flag.

Polo. See SPORTS.

Polonium. A recent series of important investigations have been conducted by Mme. Curie and Prof. A. Debiere, on the isolation of polonium. Many problems of great interest are connected with this question; since it represents the last radio-active term in the series derived from radium. Theoretically, also, polonium giving rise to an emission of rays should produce helium, and as this has not yet been observed, it is important to ascertain why, or to what extent fact and theory do not coincide. Writing of their researches in *Comptes Rendus*, 14 Feb. 1910, these investigators say:

"We have undertaken recently a chemical research with a view of preparing polonium in a concentrated state. This was performed on several tons of residues from the uranium minerals which were at our disposal for this purpose. The metal was treated with warm, strong hydrochloric acid, which has the effect of dissolving polonium almost completely. The solution, which contains no radium, was submitted in a factory to operations having for their object the extraction of its active matter. This treatment, which was done under our direction and which will be described in a

more extensive memoir, furnished about 200 grammes of a substance having a mean activity of 3 500 times that of uranium, and which contained chiefly copper, bismuth, uranium, lead, and arsenic, its activity is due to polonium. We sought to purify this material by treatment in our laboratory.

"For this purpose the hydrochloric solution was precipitated with ammonia, to remove copper, and the precipitated hydrates were boiled in a solution of soda to dissolve the lead; they were mixed next with a warm solution to dissolve the uranium. All these operations were repeated several times. The insoluble carbonates finally obtained were dissolved in hydrochloric acid, and the solution was precipitated with stannous chloride. These operations together were very successful, the original activity being found in the final precipitate in a sufficiently complete manner, which we verified by appropriate weighings.

"The precipitate, which weighed about one gramme, was redissolved and the hydrochloric solution was precipitated by sulphureted hydrogen. The sulphides were washed with sodium sulphide, then redissolved, and the solution was reprecipitated with stannous chloride; the resulting precipitate weighed a few grammes. Spectrum analysis, effected on this material, showed the presence of a diversity of elements, mercury, silver, tin, gold, palladium, rhodium, platinum, lead, zinc, barium, calcium, and aluminum; some of these elements being derived from the vessels employed. On attempting to purify the active matter, we encountered great difficulties. . . . Thus, on trying to separate lead by treatment with potash we found that a large part of the polonium passed into solution, although we were able to utilize without danger the same reaction in the presence of elements insoluble under these conditions. From this alkaline solution, polonium can only be precipitated by the condition of an alkaline sulphide. The reactions which are always found to be trustworthy, are precipitation of sulphide from an acid on alkaline solution, and precipitation with stannous chloride. We have also found that polonium is easily deposited by electrolysis, and this method may be utilized for a quantitative separation when we wish to extract polonium from an acid solution, but at the same time other metals, such as gold, platinum, mercury, etc., are deposited. After many experiments the activity was concentrated in about 2 milligrammes of matter. 0.1 milligrammes of polonium ought to be found. . . in two tons of good pitchblende."

Polution of Streams. See SEWERAGE.

Pomerene, Atlee, American lawyer and politician: b. Holmes county, Ohio, in 1863. After graduating from Princeton, in 1884, he attended the Cincinnati Law School and settled in Canton to practice law, where he was a neighbor and friend of President McKinley. In 1887 he was elected city solicitor; in 1896, prosecuting-attorney of Stark county; and 5 Jan. 1911, was chosen by the Ohio legislature as United States senator.

Population in Cities, Congestion of. See CONGESTION OF POPULATION.

Population of the World. According to figures given in 1910 the population of the world to-day numbers 1,790,000,000. With

every tick of the clock a child is born somewhere in the world. With every breath somebody dies. In 1910 it is calculated there were 35,000,000 deaths, and 54,000,000 births. In 100 years from now there will be 5,000,000,000 people scattered over the face of the globe or about as many people as would make 1,000 cities of the size of Greater New York to-day. Europe in 1910 had about 130 persons to the square mile. Going on the estimate of Dr. Joseph Caccavajo, the number of persons to the square mile on the earth in 2010 will be less than in 1910. A population of 5,000,000,000 persons will be given an average of 96 persons to the square mile for the world. Doctor Caccavajo has estimated that in 1950 Greater New York will have 19,250,000 souls living within its borders. This will give the city a death rate of 1,000 persons each day and a birth rate of nearly 1,500 every 24 hours. If the five billion persons, who will constitute the population of the world 100 years hence, came to New York State to make their home the population per acre, it is estimated, would be less than the population per acre on Manhattan Island to-day. Doctor Caccavajo figures that on an average there are five births every three seconds. In New York to-day on an average there is a birth every four minutes, a death every seven minutes, and a marriage every eleven minutes. The population of the earth by continents is as follows: Africa, 127,000,000; North America, 115,000,000; South America, 45,000,000; Asia, 850,000,000; Australia, 5,200,000; Europe, 380,000,000; Polar Regions, 300,000. The population of the earth according to race is as follows: Indo-Germanic or Aryan (Europe, Persia, etc.), 625,000,000; Mongolian or Turanian (greater part of Asia), 630,000,000; Semitic or Hamitic (North Africa, Arabia), 65,000,000; Negro and Bantu (Central Africa), 150,000,000; Hottentot and Bushman (South Africa), 150,000; Malay and Polynesian (Australasia and Polynesia), 35,000,000; American Indian (North and South American), 15,000,000.

Porter, Sidney (O. Henry), author: b. Greensboro, N. C., in 1867; d. New York, 5 June 1910. He received an academic education in Texas and engaged in journalistic work on the staff of the *Houston Post*. He was later publisher and edited the *Iconoclast* which he subsequently changed to the *Rolling Stone*. He later removed to New York and engaged in literary work. Among his books are: 'Cabbages and Kings' (1905); 'The Four Million' (1906); 'The Trimmed Lamp' (1907); 'The Heart of the West' (1907); 'The Gentle Grafter' (1908); 'The Voice of the City' (1908); 'Options' (1909); and 'Roads of Destiny' (1909); besides many short stories of metropolitan and western life, which he contributed to magazines and newspapers.

Portland Cement. See CONCRETE.

Porto Rico. An island in the Caribbean Sea, administered by the United States. The islands of Culebra and Vieques form a part of Porto Rico.

Area and Population.—The area is about 3,600 square miles. The inhabitants number 1,118,000; approximately 448,000 are colored. More than 60 per cent of the population are engaged in agricultural and industrial work.

The capital city is San Juan, with 48,700 inhabitants. Other towns are Mayaguez, 16,600 people, in 1910. Caguas, 10,350. Arecibo, 9,600, and Guayama, 8,300 people.

Government and Revenue.—The government is in charge of a Governor, with the assistance of an executive staff of six department-heads, and five native officials. The President of the United States appoints the members of the executive council. The people of Porto Rico elect representatives to the House of Delegates, they are 35 in number, and hold office two years. The English and Spanish languages are spoken. The United States came into possession of the island in 1898, at the conclusion of the Spanish-American War. The revenue for 1905-06 amounted to about \$3,545,000, and the expenditure to \$3,556,800. Customs and excise, property taxes, licenses (various), and fees, constitute the chief sources of revenue. The net local debt in 1906 was \$620,000.

Education.—Upon the advent of United States authority in Porto Rico, more than four-fifths of the population were ignorant of both reading and writing. In 1907 there were 1,150 elementary schools, with 51,800 pupils, 79 public schools, also, with 3,000 pupils; 185 private schools, with 5,300 on the rolls; and 3 high schools, with an enrollment of over 150. More than 1,400 teachers had these establishments under supervision. About 1,000 pupils have been taught in the agricultural schools of the Island; there is a university of several faculties at Rio Piedras (engineering being taught), a normal school, also, at that city; and there is a high school in the capital.

Production and Commerce.—Coffee, sugar, and molasses are the three leading articles of produce, their exportation being valued, for 1907-08, at \$14,371,900, and \$19,244,000 respectively. Tobacco, pineapples, bananas, oranges, and vegetables are grown, and some cotton is raised, the last-named product to the value of \$75,000 was exported in 1907-08. In the same year, 105,917,000 cigars were shipped abroad. Salt is the principal mineral output; deposits of gold, silver, iron, copper, bismuth, tin, mercury, nickel, and platinum being left unworked. Most of the country's trade is with United States. Imports from United States in 1908-09 were valued at \$23,618,500 from other countries, at \$2,925,750. Exports to the States in that year were worth \$26,391,400, and to other countries, about \$3,948,600.

Shipping, Railways, Posts, and Telegraphs.—The harbor of San Juan is undergoing improvement. Vessels of 9 steamship companies visit Porto Rico, Spanish, French, German, American, Cuban, and British trade being represented. In 1908-09, 350 vessels bound for United States, cleared at the ports. Railway communications on the coast are efficient, but the interior is scarcely reached. A new line, to intersect and branch into the interior, is to be constructed. Besides a line from Rio Piedras to Cagnas, there are at present more than 220 miles of line open. The government controls the telegraph system, which has about 600 miles of wire. There are 80 postoffices. The telephone system is operated through 40 stations.

Portugal. Portugal is a republic occupying the western part of the Iberian Peninsula in southwestern Europe. Until 1910 it was an



Enjoy in the Post Office Museum, Washington, D. C., of a Porto Rico Mail carrier with his equipment

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hereditary monarchy ruled by the House of Braganza-Coburg See HISTORY, 1910

Area and Population—The area and population of Portugal by provinces at the last census were as follows.

Province	Area	Population	Per square mile
Entre-Minho-e-Douro ...	2,790	1,170,361	419.5
Tras-os-Montes	4,163	427,358	102.7
Beira	9,208	1,515,334	164.6
Estremadura	6,937	1,231,418	177.5
Alemtejo	9,219	416,105	45.1
Algarve (Faro)	1,937	255,191	131.7
Islands			
Azores	922	256,291	277.9
Madeira	314	150,574	479.5
Total	35,490	5,423,132	av 152.8

The foreign population numbered 41,728, comprising 27,029 Spanish, 7,614 Brazilian, 2,292 English, 1,841 French, 918 German, 702 United States, and 561 Italian. In 1907 the births numbered 176,417 and the deaths 113,254. The population of the chief cities is as follows: Lisbon, 356,009, Oporto, 167,955; Braga, 24,202; Setubal, 22,074; Funchal (Madeira), 20,844; Coimbra, 18,144; Ponta Delgada (Azores), 17,620; there are eight other towns with more than 10,000 inhabitants. About three-fifths of the people are engaged in agriculture and one-fifth in industrial occupations; the rest are engaged in fisheries, commerce, transport, the professions, various branches of the government, etc.

Government.—See HISTORY, 1910

Finance.—The total revenue for the year 1908-09 was \$70,530,000, and the expenditure, \$72,700,000. The total debt prior to the revolution was about \$86,000,000.

Army.—See ARMIES OF THE WORLD.

Navy.—See NAVIES OF THE WORLD.

Education and Religion.—Up to 1910 the Roman Catholic religion was the State religion, but the revolution of that year was anti-clerical as well as anti-royalist, and produced great changes in the status of the Church in Portugal. The number of Protestants in Portugal in 1900 was 4,491, and that of Jews, 481. The sees of the three ecclesiastical provinces are at Lisbon, Braga, and Evora.

Primary education was supposed to be made compulsory in 1844, but the law has been so little enforced that it is estimated that in 1900 about 75 per cent of the population over six years of age could not read or write. In 1908 there were 5,247 public and over 1,600 private primary schools. There are 23 normal schools with 1,168 students, 30 State lyceums, and various colleges, seminaries and technical schools. The University of Coimbra, founded in 1290, has faculties of law, medicine, theology, mathematics, and philosophy, and more than 1,000 students. The expenditure on public instruction, in 1909-10, was estimated at about 3,000,000 milreis.

Agriculture.—About 43 per cent of the area of continental Portugal is waste land. Much of this is mountainous, but it is thought that some of it is susceptible of cultivation. Of the cultivated 57 per cent, 26.2 per cent is under cereals, pulse, pasture, etc., 3.5 per cent is under vineyards, 3.9 per cent under fruit trees, 17.3 per cent under forest, the vast acorn woods of the south affording food for herds of swine. In the north, the chief farm-products

are maize and oxen; in the mountains, rye, sheep, and goats; in the central region wheat and maize, and in the south, wheat and swine. Wine has been one of the famous exports of Portugal for centuries, port being originally known as 'wine of Oporto.' Olive oil, figs, tomatoes, oranges, onions, and potatoes are largely produced.

In the north, peasant proprietorship and a peculiar system called *alforamento* or *emphyteusis* prevail. By the latter system, which is very old, the owner transfers the land to the tenant, parting with all his rights in the holding save the right to the quit-rent, the right to distrain if this be withheld, and the right to evict if it be unpaid for more than five years. The tenant, subject to these rights, can cultivate, improve, exchange or even sell the holding. In the South larger properties are common.

Exports and Imports.—The value of the leading exports and imports in 1908 amounted to, exports 30,068,212 milreis, imports 67,257,083 milreis. Wine is the most important export, in 1908 the export of common wine amounted to 3,673,973 milreis; Madeira 489,184, port, 4,945,417, other liquors, 145,275. More than half is sent to Brazil and to England. The exports of colonial produce through the ports of Portugal amounted to 10,791,421 milreis, the most important being cacao and rubber.

Industries.—Portugal has 32,673 persons and 10,134 vessels of 30,069 tons engaged in fishing, besides the cod fisheries, which employ 946 persons and 30 vessels of 6,231 tons. The fish exported are sardines and tunny fish. Whale fishing is also carried on in the Azores. The total value of the mineral produce in 1908 was 1,696,626 milreis. The most valuable of these minerals were ore for sulphur, copper precipitate and cupreous iron pyrites; other minerals found in the country are anthracite, arsenic, antimony, gold, silver, lead and tin. Common salt, gypsum, lime, and marble are exported. Several tin mines in Braganza have, since 1903, been worked by a Belgian company.

Communications.—The commercial navy of Portugal, including her colonies, in 1909 contained 102 steamers of 68,220 tons in the aggregate, and 538 sailing vessels of 52,416 tons. In 1908, 11,045 vessels entered her ports. The railways open for traffic in 1910 comprised 1,758 miles, of which 672 miles belonged to the State. The number of post-offices was 3,682; and the number of telegraph offices 516.

Social Conditions.—The number of persons convicted of crime in 1907 was 17,814, inclusive of 3,532 females. No statistics are available regarding pauperism. Most of the charitable institutions are private or religious in character.

Considerable colonies of Portuguese have migrated to the United States of late years, and they are especially numerous on the coast of New England, being attracted thither by the cod fisheries. 20,000 Portuguese are found in Massachusetts alone.

History, 1910.—The overthrow of the Braganza dynasty in Portugal in Oct. 1910, and the establishment of a republican government, arose from two causes, the immediate cause being the anti-clerical agitation, and the remoter and complicating cause, fiscal evils of long standing which have resulted in the corruption of all political parties. It is not claimed that King Manuel or his immediate predecessors

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were responsible for either of these evils, in fact, it is stated on good authority that King Carlos, father of King Manuel, was assassinated because he was honest, and because he had attempted to curb the grafting of both the Regeneradores, or Conservatives, and the Progressistas or Liberals. In pursuance of this idea he temporarily suspended the constitution, and made his premier, Franco, practical dictator. The two great parties had until that time operated on a basis of mutual understanding to exploit the people. Franco had for several years been at the head of a third party of reform, whose efforts were baffled by the hordes of dishonest officeholders and courtiers, and the King offered him the dictatorship on the understanding that he should use it to wipe out the régime of the grafters. This was in 1906.

In 1809 the public debt amounted to \$864,561,212, a huge load for a nation of 5,500,000 people with an area of 40,000 square miles. King Manuel felt that unless some means were taken to lessen this burden, the result of century after century of mismanagement, dishonesty and extravagance on the part of the ruling Powers, the fall of the dynasty must ensue. But this movement for reform and retrenchment was none the less extremely popular.

On 1 Feb. 1908, as the King, the Queen and their two sons were driving, with the premier and several cabinet ministers, to the palace, several men approached and shot King Carlos and his eldest son, Luiz Philippic, and attempted to kill Manuel, the younger son, then 18 years old.

The accession of Manuel was followed by a retirement from the policy of absolutism which had cost the royal family so dear. The opposing factions again began to struggle for supremacy, and the anti-monarchists worked openly.

Finally, after various strikes and riots, the shooting of Professor Bombarda by Lieutenant Santos, a half-insane officer, in the consulting room of the Lisbon hospital, precipitated the uprising which ended in the exile of King Manuel and his family. The population attributed the murder of Doctor Bombarda, a popular leader of the anti-monarchists, to a political plot, and the mob filled the streets. King Manuel, surrounded by 10 loyal regiments, held the Royal Palace until the morning of 5 October, against the bombardment of warships in the harbor flying the red and green republican flag. On that day he left the palace and eventually took refuge in England.

The provisional government was composed of Theophile Braga, President; Alfonso Costa, Minister of Justice; Bernardino Machado, Minister of Foreign Affairs; Bazilio Telles, Minister of Finance; Antonio Luiz Gomes, Minister of Public Works; Colonel Barreto, Minister of War; Amaro Azovado Gomes, Minister of Marine; Antonio Almeida, Minister of the Interior; and Eusebio Leao, Civil Governor of Lisbon.

The attitude of Europe toward the Revolution varied from the position taken by France, which practically indorsed the Republic, to that of the strongly Catholic countries which condemned especially the driving out of the religious and the secularization of the schools. Monarchical governments in general regret, more or less openly, the exile of the King and the erection of the republic, but it is extremely doubtful whether this sentiment is strong enough

to assist King Manuel to regain his throne should he make an effort to do so. The House of Braganza, which has governed Portugal for some six centuries, ever since the nobles of Portugal rose against the rule of Spain, has never been conspicuous for good judgment in ruling, and some of its sovereigns have been widely and foolishly extravagant. Against the personal honor and bravery of King Manuel himself nothing can be alleged, but when attempts were made to find a Catholic princess for the throne of Portugal some time since, the situation in that country was even then so uncertain as to make royal fathers and mothers doubtful of entrusting their daughters to such a future. Don Miguel of Braganza, formerly a claimant to the throne, now living in Munich, has disclaimed any intention of taking part in the revolution on pressing his claim to the throne at the present time. He married, in 1909, an American heiress, Miss Anita Stewart.

The President and Cabinet continue the same, except that Jose Relvas is now Minister of Finance. Senor Braga is the author of more than 100 books and pamphlets, in one of which, 'The History of Republican Ideas in Portugal,' published in 1880, the author foreshadows an Occidental Latin republic, a federation of France, Italy, Spain, and Portugal.

The first step of the Republic was to order all religious bodies to leave the country within 24 hours. It promised the suppression of religious houses and the separation of Church and State. President Braga in an interview with the correspondent of *Le Matin* emphasized the philosophical source of the revolution, leaders being mainly men of learning. It was his ambition, he said, above all, to restore the Portuguese people to their former intellectual rank. To this end the schools have all been secularized, the leaders believing that intellectual freedom will thereby be secured.

The exile of the religious element, much of which sought refuge in the United States, and large numbers also in England, has worked a great deal of hardship. The government had stationed troops wherever possible to prevent violence, but unauthorized mobs nevertheless succeeded in destroying much religious property and offering more or less violence to monks and nuns in some cases. In the Jesuit monastery in Lisbon the whole interior of the church was wrecked and the organ destroyed. It is officially announced that the whole list of killed and wounded in the Revolution amounted to 61.

Freedom of the press has been established, and the plan of government as elaborated is modelled in general upon that of France, with some modifications adopted from the United States. Members of Parliament are to be elected for three years, and the President will be chosen by Parliament for a term of five years, being ineligible for reelection until another term has intervened. The Cabinet will be appointed by the President in accordance with the general complexion of Parliament.

A new rent law is of interest to the people at large. It provides that rentals shall be for a period of one month at a time and that a written agreement is necessary to evict non-paying tenants. As most of the rentals are not on a written agreement basis this practically

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1. Lisbon.

2. Oporto.



THE PICTURESQUE CASTLE OF PENA AT CINTRA,
Which, prior to the 1808 revolution in Portugal, formed King Manuel's summer residence.

PORTUGUESE AFRICA — PORTUGUESE EAST AFRICA

puts the tenant in possession of the house, and is likely to cause a good deal of financial instability. It is also said that the working people are disposed to expect too much of the Government, and that the republic is likely to prove unstable for a time at least, for this and other reasons. The present leader of sentiment is considered to be Dr Alfonso Costa, a university professor who is spoken of as the best lawyer and politician in Portugal.

The railroad strike ended four days after it began, early in Jan 1911, the men gaining an advance in wages of half a franc a day, and some other concessions as to hours of labor. This, by improving the conditions of life for some 40,000 men, is likely to strengthen the republican regime.

With the new year Portugal gained a new coinage. Gold remains the standard, but the monetary unit is the corôa or crown instead of the milreis. The corôa serves as the Portuguese equivalent for the dollar or peso of Brazil, and will be coined both in gold and silver.

The Official Gazette, of Lisbon, published a decree of the Provisional Government by which the three judges who tried and acquitted ex-Premier João Franco are transferred to Goa, Portuguese India. The Minister of Marine, Azevedo Gomez, has ordered the warships at Oporto to proceed to the colonies, ostensibly to preserve order in them. The troops have been reminded of their promise of obedience to the existing government, and have been placed at strategic points. A proposal that finds favor among the respectable Portuguese is to exclude from office under the new constitution all that held office at any time during the last three years of the monarchy.

Portuguese Africa. Dependencies: (1) Cape Verde Islands, area about 1,480 square miles, population (1900) approximately 147,500. Among the inhabitants there were about 250 foreigners. About 3,850 of the inhabitants were white. Praia is the Capital of the dependency. (2) Guinea; area about 13,950 square miles, and population in 1900, 820,000. Portuguese Guinea is on the coast of Senegambia, and includes the archipelago of Bijagoz and the island of Bolama. The chief town of Guinea is Bissau. (3) Prince's and St. Thomas' Islands; area 360 square miles, and population (1902) about 42,100, almost 1,200 of whom were whites, and 600 foreigners. (4) Angola; area 484,800 square miles, and population 4,119,000. This dependency has a coastline 1,000 miles in length, and has important ports; viz: Loanda, the capital; Ambriz, Benguela, Mossamedes, Lobito, and Port Alexander. (5) East Africa; area 297,750 square miles, and population estimated at 2,000, seat of Government Lourenço Marques, 9,850 inhabitants. (See PORTUGUESE EAST AFRICA). The total area of Portugal's African colonies is approximately 794,000 square miles, and the population is put at 8,250,000.

Government.—The several dependencies are under Governors. The revenues as estimated for 1909-10 are about as follows: Verde, receipts \$438,000; expenditures, \$437,500; Guinea, revenue, \$273,000, expenditure, \$332,500; St. Thomas Islands, \$870,000, and \$733,000; and Angola, \$2,529,000, and \$3,679,000.

Education and Religion.—The Government assists the work of education. In Angola alone there are 50 aided, seven municipal, and two

private schools, with about 2,400 pupils. Roman Catholics and Hindus are nearly equal in numbers. Mohammedanism is widely accepted.

Public Works.—A small railway line is under construction in St. Thomas Islands. Angola had more than 500 miles of line at the end of 1909, and a prospective railway line under construction that will reach 1,200 miles. There are 1,950 miles of telegraph line in Angola, the chief African dependency, and cable communications east, west, and south.

Production and Trade.—The principal agricultural products are coffee, medicinal products, millet, rubber, oil seeds, cinchona, cacao (22,730 tons raised in St. Thomas Islands in 1904), sugar, vegetable oils, cocoa-nuts, etc. Wax, ivory, fish, hides and oxen, and such minerals as copper, iron, salt, and gold, are included in the production of the country. Textiles are the leading articles of import, and coffee and rubber constitute the most profitable exports. The imports into the Cape Verde dependency in 1908 were valued at about \$2,097,000, and the exports from the colony at \$355,000. St. Thomas' imports and exports amounted to about \$3,186,000 and \$7,921,000, respectively. The imports carried on three rivers of Angola in 1908 were valued at about \$102,000, and the exports carried on the same rivers were worth about \$117,000. The value of all the imports into the dependency of Angola in 1908 was about \$5,138,000, and of the exports abroad about \$3,731,000. More than 4,000 vessels visited the ports of Portuguese Africa (exclusive of East Africa), in 1908. The steamers of British and German shipping companies call at the ports of the colony.

Portuguese East Africa. Lies continuous to British Central and South Africa, and German East Africa. Consisting of territories known as Lourenço Marques and Mozambique. There are five districts: Lourenço Marques, Inhambane, Quilimane, Tete, and Mozambique; which are further divided.

Area and Population.—The area of Portuguese East Africa is about 297,750 square miles, and the population 2,000,000. The town and port of Mozambique has a population of about 4,800, 280 of whom are Europeans. The capital is Lourenço Marques, 9,850 inhabitants, 4,700 being Europeans. Other ports are: Beira, 3,400 inhabitants, of whom 740 are white, Inhambane, population 3,300—350 Asiatics and Europeans; and Ibo, and associate towns, with about 1,700 people, including more than 200 Europeans.

Government and Revenue.—The Mozambique and Nyasa Companies administer the following territories: Manica, and Sofala regions, and that lying between the Rovuma, Lake Nyassa, and the Lurio. Through the work of the Mozambique Company the land on the Zambesi has taken on a civilization aspect, and mines are being operated. The Governor-General is supported in the Government by a Council, political and judicial in character. There are District Councils in charge of the local administration. Members of the commercial and industrial classes of the colony are eligible to office in the Government Council. The present form of government was instituted in 1907. The revenue for 1909-10 was about \$5,556,000, and the expenditure was estimated at \$5,368,400.

PORTUGUESE GUINEA—POSTAL SAVINGS BANK

British and British-Indian money is used, little Portuguese coinage circulating.

Industry and Commerce.—Mineral products are the source of greatest value to the colony; rubber, sugar, cocoa-nuts, and bees-wax, however, are important articles of produce. The leading imports are cottons, iron-work, spirits, and other beverages. The imports into the capital in 1907 exceeded \$3,672,000 in value; into Mozambique, \$720,000; into Beira, \$745,500; and into Inhambane, \$405,000. In 1908 the imports into Company's territory were valued at about \$1,060,000; total imports in that year amounted to the value of \$7,956,400. The articles of export are principally rubber, mineral ores, wax, and ivory. Exports from the capital in 1908 were valued at \$2,627,300, and from the town of Mozambique at \$319,750. The value of exports from Company's territory in the same year was more than \$1,712,000; from the whole colony, in excess of \$5,616,000. Trade in transit through Portuguese East Africa amounted in 1908 to the value of \$33,976,500.

Shipping and Communications.—In 1908, 1,735 vessels entered at the ports of the colony, of these about 380 registered at the port of Beira, and 180 at the ports of the Nyasa territory. Steamers of the German East Africa Line visit regularly at the ports. On the inland waterways, 21 small steamers and more than 100 barges carry the traffic. The Beira railway has about 200 miles of line in the colony. There are nearly 60 miles of Delagoa Bay Railway line in the province; this line connects with Pretoria. The telegraph system connects with that of the Transvaal.

Portuguese Guinea. See PORTUGUESE EAST AFRICA.

Postal Legislation. Postmaster-General Hitchcock and President Taft were of accord in their recommendations to Congress that means be taken to make it possible to reduce first class postage to one cent on ordinary letters. Secretary Hitchcock, realizing the limitations of the postal department, has attempted in the ways possible under the limitations to make what reforms and advances he could. The abuse of franking privileges conferred on members of Congress and others, he also checked.

The annual report of the First Assistant Postmaster-General for the fiscal year ending 30 June 1910, showed that there were 59,580 postoffices in the country. The gross postal revenues were \$224,128,657, an increase of \$20,566,121, or 10 per cent over the preceding year. The expenditures of the department were \$229,977,224, an increase of \$8,973,121, or 4 per cent. But the deficit was only \$5,848,566, as compared with \$17,441,719 for the preceding year.

One of the reforms with the object of securing more expeditious business methods suggested by the Postmaster-General was a consolidation of mail and delivery divisions under a general superintendent, especially in large cities. To make registered mail delivery easier and not reduce its safety, on 1 Dec. 1910 a general order from the Postoffice Department permitted the delivery of mail to the responsible representatives of addresses, although not specially authorized to receive registered mail. The 13-cent stamp was dropped in 1910. The Registry fee having been raised from 8 to 10 cents it was no longer a convenience in sending foreign mail.

Postal Savings Bank. Following upon a long agitation the Senate of the United States passed a postal savings bank bill, which was designed to secure safety for small depositors and the freer use of existing money, much of which is hidden and not deposited in banks. The new system, when in full operation, is expected to bring out deposits aggregating \$8,000,000,000, all in deposits of less than \$500.

The agitation in the United States was brought about chiefly on account of the savings banks in other countries. Gladstone referred to the English act installing the savings system as the most important that had been passed in fifty years. The law there was passed in 1861 and the operation of the system was so successful that since that time similar systems have been installed by France, Austria-Hungary, Italy, Sweden, Russia, Belgium, the Netherlands, and in all the colonies of these countries. Brazil and Chile have also passed laws.

The postal savings act provides for the establishment of a postal savings system under the management and control of a board of trustees consisting of the Secretary of the Treasury, the Postmaster-General, and the Attorney-General, acting ex-officio. The board is authorized to make all needful rules and regulations in reference to the receipt, transmission, custody, and investment and repayment of money received. Any postoffice where money orders are made and accepted becomes a postal savings bank. This in the beginning, under the discretionary powers left the Postmaster-General, will include only 7,500 postoffices, but this number will be increased as advisable. The total number of money-order postoffices is 43,000.

Any person of 10 years of age or over may become a depositor, and the only restrictions are that no one can deposit more than \$100 in a calendar month, or \$500 altogether. More than one account in the same name is also forbidden.

Deposits must be made in sums of one dollar or multiples of it, but smaller sums can be saved by the use of a card and stamp system, allowing accumulation up to one dollar, when the card and stamp can be deposited at the postoffice. Interest will be paid at the rate of 2 per cent per annum and a deposit may be withdrawn on demand, subject to rules found advisable by the board of trustees.

One of the difficulties that has arisen in Congress over the act is the question of local depositories. Some bankers maintained that this system would require such an expensive outlay for safes that it would prove profitless, but the Government contemplates keeping very little money on hand in the postoffices, having a balance at the most convenient bank. The act provides "that postal savings funds shall be deposited in any solvent bank or banks, organized under National or State laws, and subject to public inspection and examination doing business in the neighborhood in which the post-office is situated." To secure this money the banks are to be required to pay 2¼ per cent interest per annum, the Government handling the system on a basis of ¼ per cent per annum. In England it has been found that the postoffice department has needed only 70 additional employees to take care of the postal savings business, which has reached the height of \$700,000,000. If this country develops a

POSTAL SAVINGS BANK — POTASH DISPUTE

business approximately 10 times as great, a larger force will be necessary.

The chief reason why the postal savings system has received the support of business interests is that many millions of dollars now in hiding will be entrusted to the Government, as it guarantees payment and gives the depositor absolute assurance of receiving back his money. At the same time it is not expected to interfere with the business of ordinary savings banks which pay in many instances twice as high interest.

The system will also be of great assistance to the Government in raising funds promptly in case of war. All the money on deposit can be withdrawn by the Government at any time and invested in Government bonds or other securities, making the Government's resources at any one time greater by \$8,000,000,000.

In every country where postal savings systems have been installed, they have been maintained without great difficulty and have become very popular. Objections have been made to the Government guaranteeing money over which it has no actual control. Another objection raised is that interest rates vary throughout the country, while under the national act the rates are to be the same. At national banks in New England interest is figured at 2.66 per cent, while in western States it is 3.69 per cent. Under the act the banks are to be charged only $2\frac{1}{4}$ per cent over the entire country, although ordinarily they pay more. The banks, having the money, are to be permitted to invest it like their ordinary deposits.

A variation on the act has been suggested, by which the system would work out as outlined, but the money, instead of being turned over to banks, should be gathered at central points by States or districts and turned over to local boards or trustees for investment.

On 3 Jan 1911, 48 new postal banks, one in each State, were opened for business and each showed a readiness on the part of depositors from the first day. These were established merely as a beginning, and as they become in good working order others will be steadily added until the entire system is carried out.

The United States was far behind other nations in adopting the postal savings system. At the beginning of 1911 even the Gold Coast of Africa had \$1,100,000 postal deposits, Tunis had \$1,000,000, Formosa, \$1,000,000, and Egypt \$2,000,000. In Europe the success of the system was pronounced. France had 5,000,000 postal depositors, with an average deposit of \$56. Italy's 5,000,000 depositors had an average of \$55. Belgium's 2,000,000 had \$63 apiece, and Russia's 1,700,000 \$72. Japan, which pays the highest rate of interest, had 8,000,000 depositors, but the average deposit was only \$5. England, which began the system, had over 11,000,000 depositors with deposits approaching \$100,000,000. The surplus profits from 1861 to 1908 were \$11,142,425, but since 1902 there has been a deficit of \$500,000 a year, due to the fall in interest rate of British Consols from $2\frac{3}{4}$ to $2\frac{1}{2}$ per cent. Canada, which has had postal savings banks since 1868, originally paid 4 per cent, but it is now paying 3 per cent. The average deposits in Canada are about \$300. In France, where the rate of interest is $2\frac{1}{2}$ per cent, the funds are invested in government securities and other stable investments. The

annual profit ranges from \$400,000 to \$1,000,000 a year. The reserve fund 1 Jan. 1911 was \$10,000,000.

In the United Kingdom more than 5,000 children have savings accounts. France has banks especially for its sailors. When a deposit account has reached the maximum allowed, the postal savings banks of the United Kingdom, Canada, France, Italy, and some other countries accept additional deposits for the purchase of government securities. In England it is also possible to purchase insurance or an annuity from the postal savings system. Austria has even permitted a checking system in connection with its postal banks. Checking accounts can be opened on a deposit of \$20. The cost of administration varies from .23 of 1 per cent of the deposits in Italy to 1.35 per cent in Austria. See MESSAGE, PRESIDENT'S.

Potash Dispute. The German Reichstag passed a law in May 1910 regulating the potash output of Germany and seriously affecting American buyers and consumers, who purchase over half of the potash exported. As Germany is the country producing most potash and it is needed, particularly for fertilizers, in this country, the American purchasers, many of whom had secured contracts, were placed in an embarrassing position in spite of their contracts, the representatives of the German syndicate having it in their power to increase the export duty to a point that would make it worth while for American purchasers to come to terms with the syndicate. The matter finally reached the State Department and was taken up through negotiations, which promised to have no immediate end.

For more than 30 years the potash business has been controlled by a German syndicate, which has had power not only over the production but the sale of the commodity. The syndicate has always lasted for five years and then been reformed. The last agreement of this kind came to an end at midnight 30 June 1909, and the representatives of over 60 mines who had gathered to form a new syndicate failing to reach an agreement that night, American purchasers who were in Germany at the time took advantage of the temporarily open market to make contracts. One large American purchaser secured contracts for potash covering seven years, but the next morning at 9 o'clock the meeting continued, an agreement was reached, and further opportunities to purchase in an open market were closed.

These contracts were 35 per cent lower than the price fixed by the syndicate and created a sensation when they became known. One item, muriate of potash, was purchased at \$20 a ton, although the syndicate price was \$33. Attempts were made to induce the Americans to give up their contracts, but this they refused to do, although the German Government is interested in the syndicate and some of its officials intimated that a means would be found to bring them to terms. In Aug. 1909, representatives of the syndicate came to America to negotiate further, but returned without result, and in the following month representatives of 60 American purchasers went to Germany and on the strength of contract with one of the mines that they could have potash as low as any American purchaser, were able to force

POTASH DISPUTE—POTT

this mine to give them contracts which placed them on a par with the American purchasers who had made their contracts during the few hours of open market. Previous to this time there was \$6,000,000 involved. The amount was now increased to \$25,000,000.

In Dec. 1909 two directors of the potash syndicate met representatives of the American purchasers in New York and by showing that they were in a position to take retaliatory measures in the way of export taxes, they secured an offer from the American purchasers to part with half the advantage gained. An absolute agreement was, however, not made.

The American purchasers then laid the matter before Secretary of State Knox, asking if there were any means of forcing the German syndicate to live up to its contracts to the letter and to prevent them from practically invalidating the contracts by adverse legislation. Secretary Knox immediately made an emphatic protest to the German Government through Ambassador Hill, with the effect that a bill fixing a discriminatory export tax was withdrawn. At this time there were negotiations afoot which gave to Germany the benefit of the minimum American tariff, and German commercial interests were anxious not to antagonize the United States Government. But, in May 1910, an even more drastic bill was introduced in the Bundesrath, and, although the American State Department was assured that the law as amended would not be detrimental to the American contracts, all shipments of potash after the law went into effect were taxed \$22 a ton over the contract price, making the price of muriate of potash, for instance, \$42 instead of \$20 a ton. Telegrams were sent back and forth between the State Departments of the two countries, but the matter was not taken up for negotiation until September. M. H. Davis, commercial adviser of the State Department, was sent to Berlin at that time to investigate the reasons for the passage of the potash law and its consequent disastrous effect on American contracts. For eight weeks negotiations were continued without result, but during that time neither the Imperial Government nor the potash syndicate made any advances towards settlement and the initial moves were confined to the representatives of the United States. A committee of five, representing the American purchasers, for a second time agreed to go half way, in effect giving up \$12,000,000, but this was absolutely refused and the American committee left Berlin.

The law passed last May limits the production and does not directly attack the American contracts, but since these are confined to a few mines, the effect is the same. There is no absolute bar to the production of sufficient potash to fill the American contracts, but the limitation is placed in the way of tax penalty for production beyond a certain point, amounting to the same thing.

In the midst of the controversy, in the fall of 1910, potash discoveries were made in Austria which had the effect of greatly reducing Germany's monopoly. Of the 100,000 tons used annually in this country, the agents of the Austrian mine owners stated that they were in a position to furnish 30,000 and bid for the American trade to that extent. These potash deposits are in Kalusz, in the Austrian prov-

ince of Galicia. The Austrian agents came into the field at this time with offers for contracts covering a number of years, which would make it worth the while of the owners to make expensive preparations for mining the potash on a large scale. The Austrian Government is itself interested in the potash mines.

At the beginning of 1911 the matter remained unsettled, the Americans paying the additional prices and not obtaining any advantage from the shrewd contracts made.

During the negotiations with Germany the American State Department intimated to the German Government that it was anxious not to take recourse to laws discriminating against foreign products sold in the United States, but that such action as the Imperial Government had taken was of a nature to call for retaliatory measures.

Germany, contending from the start that the contention is a matter for legal decision, has refused to admit at any time that the trouble could be carried to a conclusion diplomatically. It has suggested that the American interests apply to the German courts for redress, but this the Americans have refused to do. The dispute having reached this point and no conclusion being in sight, it was suggested at the close of the eight weeks' conference that the matter be referred to The Hague tribunal for final settlement.

Potatoes. The 1910 potato crop ranked sixth in order of value among the crops of the United States. Only two or three times previously in the history of the United States has such a valuable crop been produced, while in comparison with the average value of the five previous years the value of the 1910 potato crop was 1 per cent greater. With the sole exception of the crop of 1909, which was in a large degree an over-production, the crop of potatoes last year was the largest ever grown in this country, being estimated at 328,787,000 bushels. This crop, in point of quantity, was 8 per cent greater than the average quantity for the five years immediately preceding.

Pothier, Aram I. American politician: b Province of Quebec, 1854. He took part of the course at Nicolet College and moved with his parents to Woonsocket, R. I., in 1870, with which place and many of its industries he has been identified ever since, being the city auditor 1889-94, and mayor 1894-95. He was commissioner from Rhode Island to the Paris Exposition of 1889 and 1900; Lieutenant-Governor of Rhode Island, 1898, and was thrice elected Governor for the years of 1909, 1910, and 1911.

Pott, Francis Lister Hawks, first P. E. missionary bishop of the district of Wu Hu, China, set apart from the district of Hankow: b New York City in 1864, the son of James Pott, the well-known New York publisher, who named the son for his old time friend, the distinguished clergyman, educator and historian of the church. He was graduated at Columbia, L.H.B., S.T.B., in the class of 1883, and at the General Theological Seminary B.D. 1886. He was ordered deacon in 1888 by the bishop of New York and ordained priest by Bishop Boone the same year, and almost immediately left for China where he began extensive educational and evangelical work at Shanghai. He became president of St. John's College and a

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member of the Council of Advice of the Missionary District of Shanghai, spent the winter and spring of 1909-10 in the United States in behalf of the Laymen's Missionary Movement, and on his return trip to China he attended the Edinburgh Conference of the Anglican Church. He translated such theological books as he needed in the college into Chinese among which are 'Commentary on the Apostles Creed' 'Life of Christ,' 'Parables of Christ,' 'Extension of the Kingdom of Heaven,' 'Science Primer,' 'Physical Geography.' He is the author of 'Outbreak in China,' published in English (1900), and a 'History of China,' in English (1903). At the General Convention held at Cincinnati in 1910 he was elected bishop of the newly created missionary district of Wu Hu and he was consecrated in 1911

Powers, Caleb, American politician. b. Laurel County, Ky. In 1899 he was the Republican candidate for Secretary of State of Kentucky with William S. Taylor for Governor, and the Republican party claimed the election of their ticket. William Goebel contested the election and carried the question before the Kentucky Legislature, and on 30 Jan 1900 a test vote indicated that the Democratic candidates would be seated, but the same day William Goebel was shot and mortally wounded while on his way to the capitol. Governor Taylor prorogued the Legislature to meet at London, Ky., but a majority of the joint legislature in session at the State capitol declared Goebel elected, and the chief-justice of the Court of Appeals administered the oath of office to the dying man 31 January. He died 3 February following, and John C. W. Beckham, who had already taken the oath as Lieutenant-Governor, was sworn in as Governor. Caleb Powers, Secretary of State elect, as claimed by the Republican party, brought to the State Capital a regiment of armed mountaineers from his district, all Republicans, immediately after the election in Nov. 1899, intending to support his party by force if necessary, claiming a majority of over 2,000. As there was no clash of arms at Frankfort, Powers took his army home without firing a shot. As he claimed, on 30 Jan 1900 he prepared to take to Frankfort a peaceable army of petitioners, and before he arrived, Goebel had been shot, Governor Taylor had fled to an adjoining Northern State, and the Legislature of Kentucky offered a reward of \$100,000 for his arrest and delivery to the authorities of Kentucky. Then followed the arrest of Caleb Powers, James B. Howard, Henry Youtsey, and several other leaders of the Republican party; William H. Culton a deputy in the Auditor's office having made a confession asserting there had been a plot to kill Goebel, and that James B. Howard had fired the fatal shot. He accused Governor Taylor, Henry Youtsey, Caleb Powers, and others as parties to the plot. The governors of Ohio, Indiana, and New York promised immunity from arrest to Governor Taylor. Howard, Youtsey and Powers with several others were locked up charged with having part in the conspiracy to kill the governor. Howard and Youtsey received life sentences—Youtsey confessed and Howard was pardoned. Powers denied everything charged against him and on his first trial he was convicted and sentenced to life imprisonment. A second trial

resulted as disastrously, upon his third trial he was sentenced to be hanged, having been convicted of murder in the first degree, and a fourth trial resulted in a disagreement. He had been in prison for more than seven years when Augustus Willson was elected governor by the Republican party, the first since Taylor, and one of his first acts, on 13 June 1908, was to pardon Powers, Howard and all the others except Youtsey who is serving a life sentence, having fled under indictment. Powers' aged mother procured a remarkable petition signed by more than 500,000 persons, 240,000 of the petitioners being natives of Kentucky and many of them Democrats asking for the pardon of her son. Governor Willson's reason for granting the pardon was "I am fully convinced that he is beyond all reasonable doubt innocent of the crime charged against him. There is very little hope of ever having a jury trial of this case without political questions uppermost in the mind of the court, the counsel and the jury. Because of this and the unequal struggle of the defendant with no money, except that given him, against the whole power of this commonwealth, I feel it a plain duty to end this struggle." Powers was immediately released from the jail at Georgetown, and Howard from the State penitentiary at Frankfort. Governor Willson was burned in effigy, labeled "Willson, the murderer of justice." Twenty-six of the men connected with the case—judges, jurors, witnesses, and principals, had died since the trials began. Caleb Powers, a free man, at once began a canvass among the mountaineers of his congressional district to further vindicate him by sending him to Congress; at the primaries held before the election he was nominated over Don Calvin Edwards who had served the district in the 59th, 60th, and 61st congresses, and at the election in 1904 he had 18,128 plurality. Powers was elected 10 Nov 1910 to take his seat in the 62d Congress, the delegates from Kentucky in the United States Congress standing 10 Democrats and Caleb Powers, Republican.

Practices Act. See CORRUPT PRACTICES ACT.

Pragmatism. See PHILOSOPHY

Precious Stones, Artificial. See ARTIFICIAL PRECIOUS STONES

Prendergast, Edmund Francis, R. C. auxiliary bishop: b. Clonmel County, Tipperary, Ireland, 3 May 1843. He came to the United States in 1859, and received his education at the College of St. Charles Borromeo, at Overbrook, Philadelphia, Pa. He was ordained priest by Bishop Wood, 17 Nov. 1865, and was assistant pastor of St. Paul's, Philadelphia, and of St. John's, Susquehanna. He was rector of St. Mark's, Bristol, Pa., of the Church of the Immaculate Conception, Allentown, Pa., 1871-74, and of St. Malachy's, Philadelphia, 1874-97. He served on the board of diocesan consultation at Philadelphia, and was made vicar-general of the arch-diocese in 1895. On 24 Feb. 1897, he was consecrated auxiliary bishop of Philadelphia with the title of bishop of "Scillis," Archbishop Ryan acting as consecrator, assisted by Bishops Horstman and Hoban and Cardinal Gibbons.

Presbyterian Church in the United States, otherwise known as Presbyterian Church, South. An evangelical Christian denomina-

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was organized as a separate body in 1861 by 47 presbyteries that withdrew from the parent church on account of political action taken by the General Assembly of the Presbyterian Church in the United States of America. In 1909 the denomination had 3,217 churches, 1,525 ministers, and 209,723 members, with 14 synods and 83 presbyteries. Received for Foreign Missions, \$223,879; Home Missions, \$270,318; Education, \$250,903; Colored Evangelization, \$20,321; total for all causes, \$3,507,075. The 1907 Assembly by the adoption of the Charlotte Articles of Agreement voted to retire as one of the initial members of the Alliance of Reformed Churches of America, holding the Presbyterian system, and voted to enter the general federation of Protestant Churches of America. The church completed the raising of a special endowment fund for missionary relief of \$250,000, and the Assembly resolved to raise \$500,000 additional. The plan of a summer school of theology and Bible study at Montreal, N. C., was endorsed. The opening at Texarkana, Ark., of a branch depository for church publications was consummated. The Assembly of 1908 organized the new synod of Oklahoma, and began the publication of the *Home Mission Herald* for publicity work of the Home Mission field. The Assembly appointed an *ad interim* committee to draft an amendment to the form of government relating to church property. It resolved to celebrate at its next assembly the quadri-centennial of the birth of John Calvin. It authorized the republication of official documents bearing on its distinctive principles. A committee on evangelistic work was appointed, and a committee to inquire into the expediency of establishing a judicial tribunal to relieve the assembly of hearing cases of appeal and complaint. The quadri-centennial of the birth of John Calvin was celebrated at the 1909 assembly.

Presbyterian Church in the United States of America. An evangelical Christian denomination, established in Scotland by John Knox, who came under the teaching of John Calvin at Geneva, from whom the church received its early system of theology. At the General Assembly, 26 May 1906, it was "Resolved, That in the Presbyterian Church no acceptance of the doctrines of the church is required of any communicant beyond a personal faith in Jesus Christ a Son of God and Savior of the World, and a sincere acceptance of Him as Lord and Master." The first Presbytery in the United States was organized at Philadelphia in 1706, and the First General Assembly convened at Philadelphia 1789. The One Hundred and Twenty Second General Assembly met at Atlantic City, New Jersey, 19-28 May 1910. From the reports of this Assembly the following figures are taken. Synods, 37; presbyteries, 293; ministers, 9,073; licentiates, 252; local evangelists, 252; candidates for the ministry, 1,152; churches, 10,011; elders, 38,840; communicants, 1,339,000; Sunday-school scholars, 1,211,527; home missions, \$1,497,271; foreign missions, \$1,311,413; education, \$149,437; Sunday-school work, \$205,177; church erection, \$211,786; relief fund, \$172,988; freedom \$238,352; colleges, \$460,203; temperance, \$135,181; general assembly, \$151,726; congregational, \$16,648,360; miscellaneous, \$1,777,074; total funds, \$22,958,968. The home mission field is

large and constantly growing and embraces every State in the Union, Alaska, Porto Rico, and Cuba. The Women's Board of Home Missions has charge of the mission school work, which includes the Alaskans, Mormons, the Mountaineers, Cubans, and Porto Ricans. The Board of Church Erection assists new and weak churches by the loan of necessary funds at a low rate of interest for the purpose of erecting suitable meeting houses and manses. The fund for this purpose now amounts to \$245,000.

The important recent action of the church are. The education board was authorized to call an annual conference of education, especially for State universities; a resolution providing "That Presbyterians should hereby enjoin and enforce the standards of our church to hold to strict account all ministers under their care, and to urge the ministers to regard the comity that should refrain from giving the sanction of our church to members of another church whose communion they have chosen"; that official representation in non-ecclesiastical organizations is contrary to the constitution of the church, but members are allowed liberty to work as individuals in such organizations; that Synods and Presbyterians may cooperate with other ecclesiastical bodies in seeking legislation on moral questions, that if the presbytery is composed of more than one race, and any one of the races desires to be in the presbytery separate from the other race or races, it may petition for authority to separate, and that it does not have to ask permission of any other race to make such a petition nor is it necessary to ask the permission of other race to grant the petition; the Articles of Agreement with the Reformed and Presbyterian churches in the United States were announced as in force and delegates to the council were elected; and the Assembly expressed its willingness to enter into relations of cooperation, federation, or organic union with other Presbyterian and Reformed churches as might be mutually accepted, but the consolidation of the Boards of the Cumberland Presbyterian Church was postponed until pending litigation should be determined, 1908. The members of the church were urged to remember their individual responsibility for violation of child-labor laws; the attention of presbyteries and churches was called to the desirability of having the churches in each community unite with those of other denominations for the formation of inter-church federations, with the purpose of evangelistic work, protecting the interest of the Sabbath, temperance, and Christian citizenship, and for the building up of a strong public opinion in support of civic righteousness; the terms of the proposed union with the Welsh Presbyterian Church were commended, 1909: The conference on House Missions was authorized to be composed of representatives of different Presbyterian and Reformed churches; decision in church polity was reached giving the presbytery full power to dissolve a church without the consent or request of its members, the property of dissolved churches to be taken charge of by trustees of the presbytery; complete prohibition was approved, and pastors were urged to inculcate total abstinence principles; the Assembly established the Theological Seminary of the South, and appointed a board to conduct and maintain it; and the use of tobacco by

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ministers and laymen was disapproved. 1910: It was voted that the Presbyterian Church is prepared to conduct negotiations for closer relations upon any interpretation of "closer relations" agreeable to a sister denomination.

Preston, Josephine (Mrs. L. S. Marks), American author b. New York. She was educated at the Girls' Latin School, Boston, and studied at Radcliffe 1894-99, instructor in English Literature at Wellesley 1901-03; and 21 June 1906 married Lionel Sirmeon Marks. In 1910 she won a prize among 300 competitors at Stratford-on-Avon, by writing a poetic drama "The Piper." The play was given a prominent place at the Stratford Shakespearean festival in April 1910.

Pretenders. The revolution in Portugal and the banishment of King Manuel added one more to the list of pretenders in Europe. He made the second claimant to the throne of Portugal. There is also a pretender to the throne of Spain and four to France. These men all enjoy a certain distinction in Europe on account of their royal lineage, and the son of one of them, Prince Miguel of Braganza, who married an American girl, Miss Anita Stewart of Chicago, may become king of Portugal, in the event of a coup-d'etat, King Manuel's flight from Portugal without making any effort to fight, having diminished his chances of regaining the throne.

An attempt was made by the Braganza family to secure \$1,000,000 from Mrs. James Henry Smith, the American mother of the Princess of Braganza, with which to carry on an aggressive campaign to secure the throne of Portugal for her daughter's father-in-law, but Mrs. Smith refused. The Duke of Braganza renounced his right to the throne of Portugal, but under existing conditions, it is probable that he would secure it if the republican form of government failed.

The attempts of King Alfonso of Spain to curtail the power of the Catholic Church gave an excellent opportunity to Don Jaime, the son of Don Carlos, the historic Spanish pretender, to lay claim to the throne and foment rebellion in many provinces. He succeeded in bringing about a state of continual disturbance in the mountain districts, but could not carry his pretensions further. His father, Don Carlos de Bourbon, who died in Vienna in July 1909, admonished his son in his will not to relinquish his claim to the Spanish throne and this will was published 16 Nov. 1910 at the height of the troubles in Spain. It bequeathed to Don Jaime the standard of Charles V as well as other symbols of power, which he was urged to cherish, and recommended that he continue the cause, not forgetting the Spanish families which had made sacrifices in his behalf.

Wood Norton, the English home of the Duc d'Orleans, was the refuge of King Manuel. He, with other members of his family were exiled from France in 1890. There has been active propaganda in his behalf in France for a number of years which has been helped by the fact that he has espoused the cause of the clericals. Several publications are conducted in his behalf and a number of small riots have been caused by his followers. The *Action Francaise* and *The Catholic Understanding* are distributed almost daily at the doors of the large churches. Among his followers some tired

of waiting and in June 1910, at a meeting in Brussels, declared their determination to take action. This, however, the Duc d'Orleans forbade and the cause lost some of its most active members. He calls himself Philippe VIII. He claims to be king of France by divine right. In support of his claim he advances the will of the Comte de Chambord and the renunciation of his rights to the French throne made for the Spanish branch of the House of Bourbon by Louis XIV, when his grandson Philippe, the first of the Spanish Bourbons, was elected King of Spain. The Comte de Paris, father of the pretender, is separated from the crown by sixteen degrees.

Prince Victor Napoleon, another pretender, was married during 1910 to the Princess Clementine of Belgium and if he should have issue would be the only pretender to pass on his claim after his death. Victor's brother, Prince Louis Napoleon, another pretender, holds an important post in the Russian army. The most capable of all the Bonapartes is the American, Charles Joseph Bonaparte, formerly Attorney-General of the United States, who is the grandson of Jerome Bonaparte, King of Westphalia. He is as closely connected to Napoleon Bonaparte as any of the European Bonapartes, but makes no claim to the throne of France.

Prices. See LIVING, COST OF.

Primaries, Closed. See DIRECT PRIMARIES.

Primitive Methodist Church. See METHODIST CHURCH, PRIMITIVE.

Prince Edward Island. A Province in the Dominion of Canada, lying in the Gulf of St. Lawrence, east of New Brunswick and Nova Scotia.

Area and Population.—The area is about 2,000 square miles, and the population 103,250. Charlottetown is the capital; population, 12,100. Other towns are Summerside, 2,900; Georgetown, 1,050.

Government, Finance, Justice, etc.—Under the Lieutenant-Governor there are an Executive Council and a Legislative Assembly, in the latter of which there are 30 members. The Provincial Legislature enjoys fully the right to regulate the affairs of the local administration. The Government receipts amounted in 1908 to about \$375,000, and the expenditure to about \$100,000 more. In that year the public debt amounted to about \$4,330,000. Justice is administered in a Superior Court, county courts, and by magistrates and justices of the peace appointed by the local government.

Religion and Education.—In 1901 there were 45,800 Roman Catholics, 6,000 Episcopians, 30,750 Presbyterians, 13,400 Methodists, and 5,900 Baptists in the population. The government expenditure on education in 1908 amounted to about \$180,000, and was distributed among 475 schools, with 580 teachers and 18,000 pupils.

Production, Industry, and Trade.—Wheat was produced in the Province during 1908 to the amount of 393,000 bushels; grown on 27,600 acres. The 1908 oat crop was 5,058,000 bushels, from 150,100 acres; and barley, 186,000 bushels, from 5,900 acres. The fishing industry is prosperous, and the stock-raising industry valuable. In 1891 there were 178,100 acres devoted to pasturage. The manufacturing industry is considerable. In 1905 there were 285 establishments, employing 2,900 people, paying

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salaries and wages aggregating \$445,700, and producing material to the value of \$1,851,600. The imports into Prince Edward Island are inclusive of all the leading prepared and "artificial" stuffs and wares; and the exports are principally raw materials, and food produce. Considerable trade is carried on with the United States.

Communications.—The Intercolonial Railway employs a ferry line to the island-province, and gives exit to products and people over all the Dominion; vessels call at the ports. There are all the modernisms of practical utility in the maritime province.

Prison Congress, International. Delegates from 42 countries attended the 1910 International Prison Congress which was held in Washington from 2 to 8 October. Delegates were present from every continent, including Africa and the Antipodes, while it was particularly significant that South America was fully represented. All phases of the criminal and prison questions were touched upon, and numerous prisons inspected by the visitors. President Taft received the delegates in the East Room of the White House on the first day of the congress and made a brief address of welcome in which he said that his own visits to American prisons had convinced him that they were very bad. He added that while the theory of prison system obtaining in the United States was on a high plane, it was the belief that it did not justify itself in the working out of daily practice.

In the evening of the same day President Amos W. Butler, of the Indiana State Board of Charities, spoke on "Convicts and Conservation" declaring that "convict resources" were being wasted, and that vast stretches of country, at present of no value, could be made fertile and of agricultural and industrial value if convicts were put to work developing them. At the second day's proceedings a recommendation was offered that a law be enacted providing for a public record of the Bertillon measurements and photographs of every citizen, whether he be a criminal or not. This matter was discussed at length but no definite action was taken. At the same session the topic of harsh punishments, such as the dungeon, starvation, silence, the solitary cell, darkness, and corporal punishment, were taken up, and almost unanimously opposed. On the third day the congress took up its work in four sections, dealing with criminal law, prison administration, crime preventative agencies, and juvenile delinquency. Section three was presided over by Sir Evelyn Brise, and most of the English delegates attended this section. Papers were there read by F. Emory Lyon, of Chicago, and Judge William H. Delacy, of the Washington Juvenile Court. The chief event of that day, however, was a public lecture delivered at the New Willard Hotel by Mr. Vander Aya, professor of criminal law at the University of Coonigen, who traced the course of the prison system in the Netherlands from the tortures that followed the time of the Reformation up to the present. Charles R. Henderson, president of the American Prison Association, and his wife gave a reception following this to all the delegates, and in the evening a public meeting was held at the New Willard at which Senor Alberto Yocchini was the principal speaker. On the next day a heated discussion was provoked by

the suggestion that prisoners be paid for the work they perform according to their industry, the proceeds of their labor to go to their families. This was rejected to, not because the delegates did not believe in taking all due care of prisoners' relatives, but because the laws of several countries, including the United States, prohibited the payment of any money whatsoever to prisoners. A provision favoring the providing of productive work for prisoners, including those in houses of detention and county jails, was finally adopted. On the same day the question of public institutions for inebriates was discussed, and all the delegates declared themselves heartily in favor of such institutions, declaring that 7 per cent of all the crime which came under their jurisdiction was tracable to drink, and the proper care of drunkards would appreciably lighten the burden of their labors. On 8 October the congress came to a close with the selection of Sir Evelyn Brise as president, and London as the place of the next meeting, which will take place in 1915. A special prison inspection tour was conducted, and most of the delegates availed themselves of the opportunity of thus seeing the American prison system in operation. The trip occupied 10 days, during which the visitors had the privilege of inspecting the chief penal and corrective institutions of New York, Ohio, Indiana, and Illinois.

The International Prison Congress is not quite 40 years old, the first meeting having taken place in London in 1872. The United States Government took the real lead in the organization of the congress, for in 1871 Dr. E. C. Wines had been sent abroad by President Grant to interest European nations in the holding of a great meeting for the discussion of all matters relating to the prevention and treatment of crime, and the improvement of criminal law and prison administration. It was directly from the organization of Dr. Wines that the present congress has sprung. At the first meeting in 1872 the International Prison Commission was formed. This consists of one member from each of the countries represented at the congress, and serves as an executive committee and permanent council to the congress.

The delegates which the 1910 congress brought together include some of the most noted prison and criminal authorities in the World. Ricky de Belle, ministerial counsellor to the Hungarian minister of justice, was one of these. He is one of Hungary's foremost administrators and was president of the International Congress in 1905. He is the head of the Hungarian prison system, and has devoted himself with most gratifying results to the proper and humane treatment of the released prisoner, as well as the dependent and delinquent children. Sir Evelyn Brise, who was elected president of the coming congress, is easily the most eminent living English prison authority. He was knighted in 1902 for his remarkable services to the prison system and for his efforts in introducing into the British penal system what is known as the "Borstal system." Adolph Prims, another delegate, was formerly a professor of criminal law at the University of Brussels, and in 1884 became general inspector of the Belgian prisons. Victor Almqvist, Sweden's representative to the meeting, is a criminologist of wide European reputation, and has been a prominent factor in bringing about numerous prison reforms in

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foreign countries. Another delegate of international reputation was A. Typaldo Bassia, the deputy from the province of Cephalonia and Ithaca, in Greece. He is one of the members of the permanent Arbitration Committee at The Hague. His activities cover a wide range of subjects, and he is a prolific author on matters of economic interest. In the latter connection he has taken up the prison situation in its relation to society, and his theories and work along prison lines has been noteworthy. Among the delegates were many who, though they have not attained international reputation, have done important work in connection with the criminal classes. Japan and China were represented for the first time at the 1910 International Congress, and it was voted to admit Spain, Egypt, and the Transvaal to membership. See PRISON REFORM

Prison Reform. During recent years much reform in prisons has been brought about by a more enlightened view of criminals and an understanding of prison practices. Publicity and a new class of practical sociologists who have taken positions in prisons have helped the betterment. The American Prison Association, organized in 1870 and having for its first president Rutherford B. Hayes, has been especially active in bringing prison officials to an appreciation of modern methods in the handling of their charges.

The reforms have taken practical form in many instances, so that the special train of prison authorities who toured the principal penal institutions of the country immediately before the International Prison Association convention in Washington in Sept. 1910, found marked signs of progress. At Elmira, Sing Sing, Auburn, Mansfield, and Indianapolis in particular they reported constant efforts in the right direction. As their route lay between New York and Chicago, thence to Washington, many large prisons were missed, among them there are several regarded as model prisons and most have taken steps to remedy old methods.

The congress of the American Prison Association and that of the International Prison Association, both held in Washington within two weeks show the importance of the movement, but there are many other local societies engaged in the same work. The general trend of the work of these societies is towards the scientific study of criminals, the enactment and enforcement of criminal laws, and a growing number advocate the establishment of indeterminate sentences and paroles.

More agitation has been aroused regarding the paroling of prisoners than any other criminal problem. Where it has been tried it has proved successful and the only serious objection comes from States where the death sentence has been abolished and life imprisonment is the worst form of punishment for the most atrocious crimes. To have these men at large under any circumstances is regarded as highly dangerous. It is, however, in relation to the men serving life sentences that the parole system has been most strongly advocated. Experience has shown that the average life prisoner loses all sense of manhood and reverts into a brute, who yields to discipline only under duress and is extremely difficult to deal with. Judge Marcus Kavanagh, in sentencing a murderer, Joseph Welcome, to prison for life on 12 Oct. 1910, expressed the horrors of life sen-

tence. After pointing out to the prisoner the horror of his crime he showed him that his own fate was much greater. "From the day you don your prison garb," he said, "there will be only the hopeless years, stretching out forever and in agony. The eternal solitude will crush in on you like an iron weight. It will be worse than a hundred deaths."

To remove the horror of this doom the parole system has been instituted. The best system has been to hold out freedom on parole as an incentive and it has proved highly successful, the life prisoners, instead of being absolutely unruly, becoming the mainstay of discipline in the prison.

The method worked out at San Quentin Prison, California, has attracted wide attention. The movement developed among the life prisoners themselves. They had heard of parole and it occurred to them they might hope for clemency by a moderate demand. According they petitioned the Governor as a body to parole one of their number each year, the fate of experiment depending upon the good behavior of the men out on parole. It was placed in effect and has proved sufficiently important for other States to adopt the idea.

Including jails, reformatories, and prisons there are now more than 80,000 prisoners in the United States. Of these about 10,000 are serving sentences for homicide in some form, and 5,000 are life prisoners. The hope of these 5,000 men rests on the success of the San Quentin reform.

The difficulty in suspending sentence and paroling prisoners has been found to be the tendency towards laxity in punishing when punishment is necessary. Criminals, expecting to have leniency shown them, in some cases have become bolder and more calloused, but any evil effect of this kind which might be felt is balanced by the severe sentences constantly imposed. The judges, however, point out that long sentences are not given the due amount of publicity and the criminal class as a whole does not appreciate the penalty of crime.

The cost of crime, aside from loss of life and other bodily and mental harm, is set down as \$100,000,000 annually. Half a billion is invested in prisons and equipment and more than 1,000,000 men are engaged, in one way or another, in the detecting and punishing of crime.

Prison reformers hold that this amount can be greatly decreased by preventing the making of hardened criminals. Reformatories, farms, trade schools, and parole, properly used, are gradually bringing about better conditions. The juvenile court and probation officers are combating the increase in the slums of the large cities where the tendency towards crime is so greatly on the increase that it is only kept in check by most advanced methods.

In spite of the work of sociologists, however, prison atrocities flourish in many penal institutions, the amount of humanity displayed usually depending upon the attitude of the prison warden. On that account the prison reformers are attempting to secure the appointment of wardens for other than political reasons.

The difference between a good and a bad warden has been proved to mean the difference between making hardened criminals out of all prisoners and the permanent reform of a large percentage of those serving sentences. There has been an increasing amount of information

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and reliable statistics on this subject showing that the amount of cruelty practiced in the American prisons is much greater than there is any need for. Anyone who investigates the available evidence finds that horrible and inhuman penalties has been common in American prisons and that wardens and guards have invented fiendish methods and appliances for punishment and the gratifying of petty malice. It also shows that the prisons which have the more inhuman practices have been responsible for an increase in crime. On the other hand, there is the unavoidable conclusion that wherever kindness has taken the place of brutality in the management of prisoners, and an intelligent effort has been made to bring the convicts to a better way of life, the results have invariably been towards a decrease of crime.

The straight-jacket is the standard form of prison torture. It can be used to inflict the most terrible punishment and, since it is usually used to extort confessions, in cases where the criminal is not responsible for the action which he is believed to have done, he suffers excruciating pain without the least justification. Cases of men being removed from straight-jackets after prolonged torture and remaining crippled for life are on record, and the even more refined punishment of "trussing" a youth in a reformatory to "break his will" have resulted in breaking the victim's back.

Prison reform societies have succeeded in many instances in doing away with the straight-jacket, the lash, the paddle, the "electric humming bird," and the water cure, all forms of punishment in use in American prisons. The whole system of the criminologists of the old school, whose every effort was towards making the prisoners more miserable, is being supplanted by more modern and humane efforts which tend toward the regeneration of the criminal by developing his mind, arousing in him an appreciation for the finer things of life, and in general making life and liberty of sufficient value so that, when released, he hesitates committing a crime which will cause him to be sent back to prison.

To bring this about many methods have been advocated and some are in actual operation. In some States farms have been established as part of the prison system and prisoners have only been allowed to work on them as a reward for good conduct. The effect of this has been to lower the record of broken rules, as the prisoners in almost every instance have shown a preference to work in the open air and have at least a semblance of freedom. Trusted prisoners in some cases even work on the roads without guards or other sign of restraint, and they less frequently run away than those under guard.

Many stumbling blocks, however, present themselves in the way of the prison reformer. Local laws and opposition from labor unions in some cases interfere, but there is also a disposition on the part of many criminals not to work under any circumstances. This is, in fact, true of most hardened criminals. Prisoners even practice malingering to avoid work. At one prison in England where there is a railroad track in the prison yard, it is not at all uncommon for prisoners to place an arm or leg deliberately in front of a wheel, necessitating amputation. In one year 25 major amputations were necessary. In order to avoid

picking oakum prisoners have placed their fingers in doorways, slamming the doors and shattering the fingers so badly that they have had to be amputated. Criminals also feign sickness and there are records of men who have persisted in pretending illness for so many years that they have completely lost the use of their legs. The majority of prisoners are not, however, fixedly criminal, and can be led into a better way of thinking by a discreet use of kindness without in any way relaxing discipline. Many wardens are succeeding in this difficult task, and where they have there has been a marked increase in the number of reformed criminals under their care. See **CRIMINALS, REFORM OF**

Prisons. See **PRISON REFORM**

Private Banks. See **BANKS, PRIVATE**

Prize Court, International. See **HAGUE COURT.**

Probation. The tendency among police magistrates and criminal court judges is to parole prisoners convicted of a first offence, whether young or old. The results thus far have been satisfactory, when the parole has been granted discreetly. As a means of preventing less hardened criminals from becoming habitually criminal, the outcome has been watched with interest. One of the most remarkable results was shown in New York at meeting held by Judge Crane of the Court of General Sessions, who held an extraordinary session on the night of 30 Nov. 1910, to summon before him all he had placed on probation during the previous two years. The number summoned was 117, and all but three appeared. By far the larger number were merely congratulated by Judge Crane, and only a few needed a reprimand. Those who had been on probation longest were released and the others were given promise of also being freed from restraint.

The New York Probation Association, organized to maintain a home for women released on probation and assist in the development of the probation system and the prevention of crime, held its annual meeting on 13 Dec. 1910, and reported that Waverley House, 165 W. 10th street, which had been used, had grown too small and an appeal was issued for a larger house. Miss Maude E. Miner, Secretary of the Association, reported success in keeping young girls segregated from hardened women when arrested. One of the most important sides to the work, Miss Miner reported, was the growing need for protection of girls 10 and 11 years old. Of the women arraigned in court in the time covered by Miss Miner's report, 1,580 had been discharged, 1,620 fined, 66 had been put on their good behavior, and 97 probationed. The effort of the association is to prevent fining. William R. George, founder of the George Junior Republic at Freeville, N. Y., reported 100 boys and 60 girls in his establishment and pointed out the growth of other similar places.

Prodigies. The year 1910 brought into prominence a group of the most startling youthful prodigies the world has yet seen. Probably the most prominent of these, and at the same time the one whose feats will prove of greatest value to the educational world, was eleven-year-old William James Sidis, a student at Harvard University, who demonstrated to the satisfaction

of several mathematic authorities the "fourth dimension" Young Sidis also invented an aeroplane to be run with radium, by means of which he claimed it would be possible to reach Mars if a sufficient supply of artificial air were carried for the use of the aviator in case of emergency

In Chicago, Fenton B. Turck, Jr., a youth of only seven years, exhibited before the Academy of Sciences a series of microscopic slides containing bacteria which he had himself mounted. His father, a professor in a medical college, averred that the boy's work was accomplished entirely without aid or suggestion, and that since his fifth year it had been impossible to restrain his inclination for research

In the line of linguistic precocity Winifred Sackville Stoner, a girl of only eight years, has surpassed even the astounding childhood feats of such noted prodigies as Macaulay, Thomas De Quincey, Charlotte Brontë, John Stuart Mill, and Margaret Fuller. The Stoner child, who is the daughter of a United States army officer, can carry on a conversation with equal ease in English, French, Spanish, Latin, Esperanto, Japanese, German, Russian, Polish, or Italian, while in the first five she can think as easily as talk. Little Miss Stoner also possesses the gift of versification to a marked degree, having excellent knowledge of metre and rhyme. Many of her verses have been collected in book form and published under the title of 'Jingles,' while *Puck* and *St. Nicholas* have repeatedly accepted her poetical contributions. This child began to learn languages at the age of three weeks. By the time she was three years old she could operate a typewriter like an expert stenographer and was writing the first of her verses. Despite her many matured accomplishments, Winifred Stoner takes real joy in playing with dolls and digging in the mud.

Still another mathematical wonder is "Marvellous Griffith," the farmer lightning calculator who was induced to display his skill on the vaudeville stage. College professors would spend weeks working out problems and proving the answers, then, when they propounded them to Griffith he would give them the correct solution in an instant. His most spectacular exhibition was mentally calculating the compound interest on one cent from the birth of Christ to 1 Jan. 1910, then like a flash telling how high a monument this sum would make in silver dollars piled one on top of the other.

1910 also brought into prominence two girls who have been deaf and blind from infancy, yet who can perform most astounding feats notwithstanding. They are Ella M. Hopkins, of Utica, and Catherine Pederson, of Brooklyn. Both the girls, after reading over once in the blind student's raised-letter book the one hundred stanzas of Sir Walter Scott's poem "Marmion," sat down and wrote a minutely literal, line-for-line copy of it. Though stone deaf, they can both speak so as to be understood by anyone; while Miss Pederson, apparently not at all handicapped by her lack of sight, does extremely creditable modelling in clay. Miss Hopkins is a versifier of no mean ability, and Mr. Enoch Currier, their instructor, entertains strong hopes that the two girls will develop into geniuses every bit as remarkable as Helen Keller, the deaf, dumb, and blind girl who went through Radcliffe College, and whose numerous activities have been so widely exploited.

Child prodigies in electricity, engineering, and wireless have mounted into the thousands in recent years. History would indicate that the genius of these youngsters is no mere ephemeral spark, but in its more matured state will prove of distinct value to science.

Simon Newcomb, for instance, worked out all the prescribed processes of mathematics for himself before he had so much as seen a textbook and even before he could articulate plainly. This precocity he displayed uniformly throughout his earlier years. His later accomplishments are too well known to require comment. From his youth Lord Kelvin demonstrated his remarkable mathematical bent and at eighteen was the author of standard textbooks on the subject. Truman H. Safford, for several years professor of astronomy at Williams College, amused himself at the age of six by working out mentally such problems as that it would take 617,760 barley-corns to surround a meadow 1,040 rods in circumference. At nine he began to issue an almanac of his own compilation, and when put to a test at the same age squared 365,365-365,365,365 in less than a minute without having recourse to pencil or paper.

George Bidder, the great British engineer, performed similar feats with equal ease all through his early life, although it was not until he had passed ten that he could either read or write, and the same may be said of Carl Friedrich Gauss. Almost all of the great mathematical minds of past generations exhibited their ability almost during infancy.

In the annals of literature the childhood feats of Margaret Fuller, Nathaniel Hawthorne, John Stuart Mill, and Thomas B. Macaulay are well known. With these, however, as such prodigies as young Sidis and the Stoner girl show, the present age is more than keeping pace.

Profit Sharing. See CO-OPERATIVE PROFIT SHARING.

Progressive Republicans. Representative Edmund Hinshaw of Nebraska, one of the Insurgents in the last House of Representatives said that when a Westerner speaks of a "Progressive Republican," he means primarily a man who is opposed to the long standing alliance between politicians and public service corporations for mutual benefit. There were days in the West when these corporations interfered in and largely controlled the affairs of whichever party was in the majority. Before the primary laws were passed, it was usually possible for a few men of influence to control the sending of delegates to State, Congressional, and judicial conventions. These men, according to Representative Hinshaw, were cultivated and favored by large corporations to such extent that the nominees for State offices were nearly always subject to corporate domination. The legislatures also were usually controllable, and rarely elected United States Senators objectionable to the large business interests. The corporations chiefly engaged in this political work were the railroads, and a free pass was their most potent weapon. Of recent years something of an awakening has come to Western people in regard to public affairs; they have seen that this system of government not only did not represent them, but was often inimical to their best interests. Out of this comes a wide-spread movement

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for the betterment of civic affairs, and it took the form in most of the States of selecting for public office men who owned no allegiance to the railroads or other corporations and then through them, of the enactment of anti-pass and public primary laws. These laws were intended for no other purpose than to bring the management of party affairs more closely into the hands of the individual members of the party.

The nearest point of agreement between the Progressive and Conservative elements of the Republican party is on the tariff. But even in this, they are not in complete accord. Both favor a protective tariff, but it is in the measure of protection that we find them differing. The Conservatives continue to favor a high tariff wall, one that effectually shuts out foreign goods under all conditions. The Progressive idea is probably best reflected in the tariff plank drafted by Director of Mint Roberts at one of the Iowa State conventions, which nominated Albert B. Cummins for governor, wherein revision was asked for those schedules of the Dingley tariff law which "afforded a shelter to monopoly." The real Progressive view is that the measure of protection should simply be the difference in cost between producing the article in question here and abroad, and that certain raw materials we need in manufacturing should come in free. There is also progressive sentiment in favor of taking the duty off trust made goods. That the present tariff act does not represent the Progressive view goes without saying. The Republican State convention in Minnesota refused to indorse it. That of Indiana did likewise and commended Senator Beveridge for voting against it. South Dakota did the same. In Kansas, four of the six Congressmen who voted for the law were defeated for renomination at the primaries. This is only a small part of the revolt against that measure. But the big ideas of Progressive Republicanism have been to keep the corporations, and more especially the railroads, out of politics, and (2) to subject them to State regulation. Wherever the Progressives have had the power this has been done. Direct primaries and the popular election of United States senators by the voters instead of by the legislatures have all been means to attain this end. The Middle West is the stronghold of the Progressive movement. It dominated Wisconsin, Minnesota, Iowa, Nebraska, North Dakota, and Kansas. The Progressive movement is strong in California where Hiram Johnson, running on a radical platform was elected Governor, and in Idaho, Oregon, and Washington. Even the Republicans of New England have had a liking for the movement. The most bitter contest during 1910 inside of the Republican party was over Speaker Cannon. The latter was a Conservative and had administered his speakership along lines that did not differ from those of his predecessors. But the Progressives felt that Speaker Cannon was a menace to their legislative program, and prior to the Republican caucus at the opening of Congress sought to prevent his renomination for that office. They relied upon the aid of President Taft and the Federal Administration. The President was unwilling at the beginning of his administration to become embroiled in party warfare and without this aid, the opposition to

Speaker Cannon collapsed. But the Progressives remained hostile. In conjunction with a majority of Democrats, they attempted at the opening session to prevent the adoption of the rules giving the speaker the power of appointing committees and also over the calendar, and almost succeeded. Later by a combination of 40 insurgents and nearly all the Democratic strength, the power of appointing committees was taken away from the speaker and lodged in a committee on *committees*, and his control of the calendar was also eliminated. The Progressive leaders in this movement were George W. Morris, of Nebraska, Victor Murdock, of Kansas, and Edmund H. Hinshaw, of Nebraska. Other Progressive members of the last congress were Albert J. Beveridge, of Indiana, Irvine L. Lenroot, of Wisconsin, Jonathan Bourne, Jr., of Oregon, Joseph L. Bristow, of Kansas, William E. Borah, of Idaho, and Moses, E. Clapp, of Minnesota. See also **INSURGENTS' MOVEMENT**.

Prohibition. See **TEMPERANCE LEGISLATION**.

Pronunciation, Simplified. A committee recently appointed, under the leadership of Mr. Irwin Sheppard, to investigate and, if possible, improve upon the present pronunciation system adopted by schools, has brought in its report, and submitted a new key alphabet, which they recommend be employed in place of that now in use. The committee consisted of Dr. William H. Maxwell, city superintendent of schools in New York; Dean T. M. Balliet, of the N. Y. School of Pedagogy; E. O. Vaile, of Oak Park, Ill.; President H. H. Seerley, State Teacher's College, Iowa; and Melvil Dewey, of New York. The following in the alphabet submitted by them.

Recommended Key Alphabet					
Letter	Name	Key-word	Letter	Name	Key-word
a		art	e		nor
ai		artistic	e		not
ai		aisle, find	ei		oil
au		out, thou	p	pi	put
a		air	r	er(or ar)	rat
a		at	s	es	set
b	bi	be	sh	esh	ship
ch	chi	chew	t	ten	ten
d	di	day	th	eth	thin
e		prey	th	eth	that
e		men	u		mood
f	ef	fee	u		push
g	gi	go	u		urge
h	hi	he	u		hut
i		marne	v	ev (or vi)	vat
i		tin	w	wi	win
iu		mute	y	yi	yes
j	ji(or je)	jaw	z	ez(or zi)	zest
k	ki(or ke)	kin	z	ez	azure
l	el	let			
m	em	met	a	for a in ask	
n	en	net	a	for a in about	
				for a in over	
n	en	sing			
o		note	i	for i in candid	
o		poetic	i	for i in added	

In explanation, the report says:

"The key provides a separate sign for each of the 44 generally accepted sounds, not one of the signs being a distinctly new letter or having a foreign look. Excepting the last two supplementary letters, the added letters are formed so as to obviate criticism on the part of the type-maker and the practical printer, as well as to be easy to write and to connect with preceding and following letters."

The experts agree that the discrimination of sounds in this alphabet is sufficiently delicate and precise for all practical purposes. It

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should be noted that the last three letters are required only, and will be used only by the lexicographers in order that they may carry out their too-realistic theory that it is the dictionary's function to record the facts not merely for their precise, formal, more or less ideal speech, as approved by educated and cultivated people regardless of their speech-habits, but the literal facts of our ordinary rapid, or careless or incidental colloquial utterance, in which precision and distinctness are not thought of.

The key discards all diacritic marks but one, the macron, which has one invariable use, viz., to indicate the long sound of whatever letter it is used with.

It is realized that the reformed alphabet cannot be employed until it is circulated in general textbooks, as used in the schools; and these will not be printed until it becomes apparent to the publishers that there will be a demand for such books, when published. The committee therefore, calls upon teachers all over the country actively to support this movement, and adopt the new standard as soon as possible.

Protection, Birds. See BIRD PROTECTION.

Protestant Episcopal Church. An evangelical Christian denomination in America, tracing its descent from the Church of England, from which it withdrew at the time of the Revolution. The following include the important items of the summary of statistics presented to the last General Convention held at Cincinnati, Ohio, Oct. 1910: Communicants, 937,861; churches, 5,336; clergy, 5,513; deacons ordained, 529; priests ordained, 508; candidates for orders, 431; postulants, 407; lay readers, 2,676; baptisms, 202,184; confirmations, 163,988; Sunday-school teachers and officers, 50,678; Sunday-school pupils, 457,237; parish school teachers, 856; parish school pupils, 29,057; industrial school teachers, 2,446; industrial school pupils, 19,110; parishes, 3,387; missions, 4,719; free church edifices, 5,336; rectories, 2,898; theological institutions, 20; collegiate institutions, 15; academic institutions, 114; church hospitals, 66; orphan asylums, 62; homes, 77; other institutions, 94. Total contributions for all purposes, \$53,916,064; endowments, \$3,769,615; for episcopal fund, \$11,364,372; for support of churches, \$2,514,850; for clergy relief and other purposes, \$21,716,283.

During the three years intervening between the General Conventions of 1907 and 1910, eight bishops have died, including Bishop Potter of New York, who was succeeded by David H. Greer. Among the eminent clergy that the church has recently lost by death are Rev. Morgan Dix, rector of Trinity Church, New York City; Dr. William Reed Huntington, rector of Grace Church, New York City, and Bishop O. W. Whitaker, of Pennsylvania. Recent events of interest include the triennial session of the General Convention at Richmond, Va., Oct. 1907, at which was passed a preliminary constitutional amendment providing that the two houses together shall elect an executive who shall be the presiding officer of the church, giving a national head to the church and unifying and concentrating power; almost unanimous consent was given to change the name of the church on the title page of the Prayer Book,

by dropping the words "Protestant Episcopal" in certain countries where the use of the same is misunderstood. An amendment to the canon was passed, giving to the bishops of the diocese discretionary power to decide whether or not Christian men, not clergymen of the church, might on special occasion speak in churches. The Bishop of London was an honored guest at the convention, coming for the especial purpose to present a copy of the Bible from King Edward VII to Bruton Parish Church, Williamsburg, Va., the direct successor of the Jamestown Parish Church. The men's missionary thank offering amounted to \$760,213, and the Women's Auxiliary, which held its triennial meeting at the same time, raised for the work of the church, \$222,353.

During the year 1908 much discussion was aroused over the difference of opinion relative to the interpretation of the amendment to Canon 19, permitting other than Episcopal clergymen to make addresses on special occasions in churches.

The Church Congress of 1908 convened at Detroit, discussing such subjects as "The Relation of Christianity to Mental and Spiritual Healing," "The Constructive Value of the Higher Criticism," "The Civil Mission of the Church," "The Influence of History upon Theology and upon Religion," "The Relation of Christendom to Heathen Nations," "The Place of Organized Christianity in Mission Life," "The Place of Character in Salvation."

The Emmanuel Church Movement was inaugurated at Boston in 1908. The American Church Union was formed in 1908 to defend and maintain unimpaired the doctrine, discipline and worship of the church against laxity and indifference within and hindrance and aggression from without.

Missionary bishops were elected for Wyoming and Western Colorado at the session of the House of Bishops in 1909. The diocese of Pennsylvania in May 1909, celebrated its 125th anniversary. The diocese of South Carolina, in May 1909, at the special request of the negro race, organized a separate council for colored churchmen, enabling colored workers to exercise self-government under the bishop.

Christian Unity movement made considerable progress in 1909. The Church Congress met in Boston in 1909, discussing the subjects, "Socialism in Relation to Christianity," "The Alleged Incompatibility of Genius and Orthodoxy," "The Ethical Aspects of Gambling," "The Possible Contribution of Oriental Thought to Present-Day Christianity," "Psychotherapy as an Aid in Pastoral Work," "The Outlook for Visible Church Unity," "The Office and Work of the Holy Spirit." At the Episcopal Convention of the diocese of New York in Nov. 1909, the leading discussion took form in a memorial to the General Convention recommending the election of suffragan bishops. At the triennial General Convention in Cincinnati, 1910, the constitution was amended to allow of the appointment of suffragan bishops; four new missionary districts were created, comprising Eastern Oklahoma, North Texas, San Joaquin and Wu Hu; one additional missionary bishopric was formed by the separation of Arizona from New Mexico; one new diocese created, to be known as Erie; the Board of Missions was reorganized, placing the entire responsibility of its management

under one executive head, with larger representation covering the entire country; the Bishops issued a declaration on Canon 19, that it was not in any way to be considered as contrary to the declaration in the Ordinal; a Mission Hymnal was set forth; the Revised Version of the Holy Scriptures was allowed to be read in the services of the Church, a new Table of Lessons was allowed for tentative use; army and navy chaplains were transferred to the jurisdiction of the Bishop of Washington; the widespread desire for Christian unity found expression in the incorporation of the Christian Unity Foundation, which received the donation of \$100,000 from J. Pierpont Morgan, and in the appointment of the World's Conference Commission on Faith and Order; the Board of Missions reported over \$5,000,000 given to missions between the triennial gatherings, and \$75,000,000 in the last 75 years; the Women's Auxiliary gift amounted to \$242,110.83, nearly \$20,000 more than three years before; it was unanimously declared that the Bible is the Word of God; six bishops were elected, making 109 in all. On Friday 16 Dec. 1910, representatives of two-thirds of the communicants of the Protestant Episcopal Church met in the chapel of Grace Church, New York City, and unanimously adopted the following resolution: "Resolved, that the chairman of the meeting be authorized to appoint the following committees, each to consist of three clergymen and three laymen, namely: a committee on publication and circulation of literature and a committee on finances, and that these two committees with the chairman and secretary, be made a general executive committee for the purpose of educating the people of the Church in the history and name of the Protestant Episcopal Church."

Psychical Research. The past year has been one productive of many striking results in the field of psychical research,—some altogether different from what had been anticipated. The work has both gained and lost in public favor. It has been deprived, for one thing, of the active services of two of its most industrious and influential workers. The sudden death of Mr. Frank Podmore deprived the English Society of a very useful member of its Council. Mr. Podmore met with a tragic and unexplained fate. His remains were found in a small pool in the north of England, near Malvern. He had been drowned whilst out walking one evening. The mystery of his death has never been explained,—the jury bringing in a verdict of "found drowned." It is thought that his death was due to accident, as several other persons have been drowned, from time to time in the past, in this very pool. Mr. Podmore, well-known in psychical circles as a great sceptic and critic, was the author of 'Apparitions and Thought Transference,' 'Studies in Psychical Research,' 'Modern Spiritualism: a History and a Criticism,' 'The Naturalization of the Supernatural,' 'Mesmerism and Christian Science,' 'A New View of Ghosts,' 'The Newer Spiritualism,' and many papers in the *Proceedings* of the Society for Psychical Research. He was joint-author, with Messrs. Gurney and Myers, of 'Phantasms of the Living.'

The second much-lamented loss during the past year was that of Prof. William James, ex-professor of psychology and philosophy at

Harvard. For years Professor James had been interested in the problems presented by psychical research, while his work in psychology and philosophy is too well-known to need more than a passing mention. Professor James was the first man to investigate the famous Boston medium, Leonora E. Piper,—a letter appearing over his signature as early as 1885, in which he asserted that he was convinced "she knew things in her trance state which she could not have found out by any normal means." He maintained his interest in her to the last. He was president of the Society for Psychical Research, for the years 1894-95.

For the past two or three years, the chief experimental work done by the English S. P. R. has been in connection with Mrs. Piper, in conjunction with two or three other mediums or psychics—Mrs. Verrall, Miss Verrall, Mrs. Holland, Mrs. Forbes, and Mrs. Thompson. All of these ladies possessed the power or faculty of writing "automatically," when in trance, or even in a semi-normal condition,—and the method of "cross-correspondence," as it has been called, was suggested by the controls or intelligences themselves doing the writing. These are supposedly the "spirits" of Messrs. Myers, Gurney, Sidgwick, Hodgson, and others, who purport to write through the hand of the entranced medium. Thus: A message would be given *in part* through one medium, and *finished* through the hand of another. Neither portion, taken by itself, would make sense, or suggest anything to the mind of the automatist (thus precluding fraud and subconscious fabrication alike) and only when the two messages were pieced together did sense appear, and it became evident what the "controls" were driving at. It was hoped that, in this way, it could be demonstrated that one and the same intelligence, or group of cooperating intelligences, was instrumental in the production of the messages. And, as a matter of fact, many striking cross-references have been obtained in this manner. An example will make this plain.

It was suggested to the "amanuensis" through Mrs. Piper that a "sign" should be given through the hand of *another* medium or automatist, to show that the same intelligences were really there, communicating and active. As a test, it was suggested that a triangle within a circle should be drawn. A few days later, the same "spirit" claimed to communicate through the hand of the other psychic, gave a message, signed his initials, and drew a triangle within a circle. This was also attempted, with less success, through still another medium.

It had been hoped that these experiments might be repeated and, if possible, extended during the past year in England. Mrs. Piper went there accordingly. All was in readiness. To the great disappointment of all concerned, however, not a single trance supervened for many weeks—almost until the conclusion of the winter. Not a single trace of any "spirit-control" was to be obtained! This curious result had never before been obtained, and was a great disappointment to all concerned. What results have been secured—probably of a somewhat abortive nature—have not yet been made public.

Meanwhile, Prof. J. H. Hyslop, head of the American Society for Psychical Research, has

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published a voluminous report, in the *Proceedings* of the American S. P. R., on his sittings with Mrs Piper. This is far too extended and technical to be reviewed here. It gives the stenographic record of a number of sittings with Mrs Piper, and other mediums, and contains a lengthy theoretical discussion of the possible "difficulties of communication"—granting, for the sake of argument, that "spirits" really do communicate. This report will repay a careful perusal by all students of the problem, as it is by far the most comprehensive thus far published on this question.

The most important event of the year, in the field of psychics, has undoubtedly been the bringing to America of the Italian medium, Eusapia Palladino, and the experiments that were undertaken in New York and elsewhere, with a view to testing her mediumship. For more than twenty years past, this medium has succeeded in puzzling the greatest scientific men in England, France, and Italy, and numerous books, pamphlets, and articles have appeared from time to time, regarding her. Born of humble parents, a share of fame has fallen to her lot equalled by few. A brief sketch of the incidents leading up to her American trip is essential to an understanding of the situation.

In Nov. and Dec. 1908, an investigation of her powers was undertaken, in Naples, by the Hon Everard Feilding, Mr. W. W. Baggally, and Mr. Hereward Carrington—who, later, brought Eusapia to America. These three gentlemen held a series of eleven sittings in their own rooms at the hotel, in Naples, and became convinced that they had witnessed remarkable physical manifestations of a unique character. The detailed report of their findings will be found in the *Proceedings* of the English Society for Psychical Research (S. P. R.), Nov. 1909. The conclusion was that, making every allowance for fraud, hallucination and mal-observation, there still remained a residue of phenomena which could not be accounted for by any theory other than to suppose that genuine, praternormal manifestations had been witnessed.

In order that American scientists might see the medium before she died, it was arranged to bring her to America for a series of tests. She arrived in Nov. 1909, and left, June 1910,—having given a large number of sittings to investigators and scientific men in the interval. The result of the series was, briefly, this:

The first twenty-five sittings or so that were given were good, and produced a favorable impression on those who witnessed them. After that, the medium seemed to "degenerate," and the character of her sésances changed. Whereas, at first, they seemed to convince all those who attended her sittings, towards the close of her trip she frequently resorted to fraud, and the conclusion was reached by a group of scientific men that nothing supernormal had been seen by them at any of her sésances.

A number of sittings were held in Columbia University, New York, and at the home of Professor Lord, one of the faculty. A number of the usual phenomena were seen, but it was ascertained that all of them had been produced by fraud on these particular occasions. A negative report was accordingly drawn up and published in *Science*, and later in the *New York Times*. It was signed by the Scientific Committee, and stated that nothing had been seen by them at any of the sittings.

which had convinced them that anything supernormal had occurred at her sésances. And this negative result was still further emphasized by the publication of an article by Professor Munsterberg in the *Metropolitan Magazine*, and one by Professor Jastrow, in *Colliers*, stating that fraud was a sufficient explanation of all of Palladino's marvels.

There can be no doubt that Eusapia resorted to trickery very extensively during her American visit. Nevertheless, Mr. Carrington, and those who had seen a number of her sésances, stoutly maintained that genuine phenomena had been observed in the past, and that, in spite of her trickery (which she had always been known to practice, when allowed to do so), she still could produce manifestations in a manner hitherto unexplained. And thus the matter stands; a number of sitters believe that they have seen remarkable manifestations in her presence; others—a minority—contend that fraud is the all-sufficient explanation. The full report of these American sésances is to be found in the *Annals of Psychical Science*, 1910-11.

The characteristic difference between the phenomena observed through Mrs. Piper's mediumship and the instrumentality of Eusapia Palladino is that, whereas the former are purely mental, the latter are physical or mechanical, almost exclusively. In the case of Mrs. Piper the problem is *not*: how does the writing come? (for it is written by the entranced medium in the usual manner) but, does the writing contain any statements which the medium could not have found out? The problem is a mental, and not a physical one. On the other hand, in the case of Eusapia Palladino, the problem is almost entirely physical. There are very few mental phenomena,—no telepathy, no clairvoyance, no "messages" from departed spirits. The problem is "Do physical objects move without contact? Do musical instruments play without human hands? Do hands and faces appear other than those of the medium or any person present?" That is the question. It seems necessary to state so much—in this place, as such misapprehension as to the nature of the problem has arisen.

During the years 1908 and 1909, Mrs. Henry Sidgwick—wife of the late Professor Sidgwick—was president of the English S. P. R. For 1910, Mr. Arthur Smith was the president, and Mr. Andrew Lang president for 1911. Prof. Cesare Lombroso, of Turin, died only two days after the publication of his book 'After Death—What?' This book is an inquiry into psychical phenomena, and largely a discussion of the mediumship of Eusapia Palladino.

One or two incidents during the past year call for special mention in this connection. In Kansas City, Mo., Dr. C. C. Carson has laid the corner-stone of an edifice to be known as the "Temple of Light," in which those mentally, spiritually or physically sick are to receive treatment free of charge, and without the administration of drugs, or any material appliances. All the cures effected here are to be made by means of the "laying on of hands"—as narrated in the New Testament! Dr. Carson states that many cures have been effected in this manner in the past, and are still being effected. As he is a spiritualist, only the advice of "spirits" and (clairvoyant) diagnosis are to be allowed. It remains to be seen

whether or not success is achieved in the undertaking.

In Chicago, Ill., Dr. Carl Wickland has opened a "Psychopathic Health Home" or Hospital for the treatment of the "obsessed." Doctor Wickland contends that a large number of cases now treated as insane and placed in institutions, are in reality "possessed" or "obsessed" by tormenting spirits, and he, by the aid of his wife, (who is a trance medium) undertakes to relieve the sufferers. Such an experiment is undoubtedly interesting, and it is certain that a number of cures *have* been effected—no matter how we may choose to interpret them.

During the past year, also, a new physical medium, similar to Eusapia Palladino, has been "discovered" by Dr. Julian Ochorowicz, of Warsaw, and developed by him in his own house. This case promises to be one of the most interesting in the whole history of the subject, if successful. The young woman originally went to Doctor Ochorowicz for treatment, and he accidentally discovered that she was possessed of remarkable powers. He was thus enabled to observe and cultivate this physical medium from the start. If successful, this will prove to be one of the most important steps ever taken in this obscure subject and important for this reason. A medium has been developed from the commencement of her career, and the actual process of the development watched, as it gradually progressed. The history of the case is as follows. A young Polish girl,—by name, Mlle. Stanislas Tomczyk,—paid a visit to Dr. Julian Ochorowicz, of Warsaw, Poland, to be cured by him of nervous troubles and other affections. In hypnotizing her, certain mediumistic phenomena manifested themselves spontaneously; and Doctor Ochorowicz conceived the idea of inducing Mlle. Tomczyk to remain in his house for treatment; so that he could, at the same time, develop her mediumship under his own eyes. He found that she presented not only hysterical and abnormal mental phenomena of an unusually interesting type, but also possessed the power, which was gradually developed, of moving material objects without contact,—much in the same manner as Eusapia Palladino moves objects in her séances. In the present case, however, everything is done in broad daylight; no regular séance is given; and the phenomena can be studied minutely, in a sensitive who is also desirous of having her powers tested as thoroughly as possible. This adds greatly to the value of the case. As she is not a professional medium, one great reason for suspecting fraud has been removed. The manifestations all take place after Mlle. Tomczyk has been hypnotized; and when she is in an abnormal mental condition. A brief history of the case is as follows:

Doctor Ochorowicz first observed the slight movement of a revolving needle, on a glass clock, in response to movements of the medium's hands, made over it. This caused him to experiment in this direction; and he soon found that she could stop the needle almost every time, just where she desired to stop it. He then experimented with other objects—a compass, a glass bottle, a magnet, a pencil, a cigarette,—a variety of objects. The result was the same in all cases. The medium placed her hands on either side of the object; waited a few moments for the 'current' to accumulate and then, raising her hands, the object was raised a foot or

more from the table. Usually, it fell with a crash.

The obvious interpretation of these facts is that, somehow, Mlle. Tomczyk had succeeded in introducing a hair between her hands, and with it raised the various objects. Doctor Ochorowicz investigated this point with great care—a point all the more important inasmuch as the medium said she raised her objects by means of "an astral hair" which she materialized between her fingers—a hair sometimes visible. Doctor Ochorowicz was forced to the conclusion, however, that no such material hair existed; he felt; he photographed objects in the air; and finally he enlarged these photographs by throwing them onto a large screen. No hair was visible; though a real hair held between the hands under the same circumstances appeared as large as a good size rope.

One curious and most interesting fact in connection with the case is that a secondary personality, calling itself "Little Stasia," developed; and become a distinct personality. It is she who, it is said, produces the various phenomena. "Little Stasia" promised that she would soon allow herself to be photographed. A few weeks later, a photograph of this little creature was obtained in Doctor Ochorowicz's house; no one being in the room. This has created a profound impression.

Finally, Doctor Ochorowicz's case has been investigated by two groups of scientific men, in Warsaw, one of which passed upon the photographs of the manifestations; the other upon the manifestations themselves. Both were conclusive. In both cases the committees decided in favor of the genuineness of the phenomena; so that, at the present day, they are credited by the majority of those who have investigated phenomena of this character. Because of the fact that the case has been observed in all its details from the start, it is considered a most important contribution of psychical science.

One of the most striking events of the year—in fact of several years,—in this field, is the publication of Dr. Stanley Hall's and Amy E. Tanner's 'Studies in Spiritism,' giving the (negative) results of their sittings with Mrs. Piper, two years ago. The book is destructive and critical throughout, and attempts to explain, on a "rationalistic" basis, not only spiritistic phenomena, and all the messages that have come through Mrs. Piper, and other similar mediums; but also telepathy, clairvoyance, and in fact, all supernormal phenomena whatever. The book is a most important one, in its way; and should be read by all close students of the problem. It is certain, however, that the book is in some respects unfair to the phenomena with which it deals, and in many cases states the facts inaccurately,—as Professor Hyslop showed at length in his review of the book. (*Journal*, American S. P. R., Jan 1911). It is probable that a great amount of discussion will be occasioned by the book, however, and this will, at all events, help to clarify the problem,—which, above all else, is greatly to be desired.

Psycho-Epilepsy. See ABNORMAL PSYCHOLOGY.

Psychology. The past few years have witnessed the gradual growth and extension of the "new" or "experimental psychology," both as applied to human beings and animals. (See ANIMAL PSYCHOLOGY). Until the middle of the

19th century, the only psychology was introspective, and largely metaphysical; and revolved around the nature of the soul, its connection with and mode of manifestation through an organism, its "faculties," etc., and was by many confounded with phrenology. The new psychology, on the other hand, discards these methods almost completely, and depends upon an objective or external method of testing the mind and its powers. Apparatus, sometimes of a very technical and complicated character, is employed, and records are kept of the various tests. The following will give an idea of the methods of the newer psychology.

Reaction experiments have occupied the attention, very largely, of psychologists of this school. Simple reactions are tried, which test the rapidity with which an individual can react to a given stimulus. In this manner, the time can be measured in which a message can reach the brain, in the form of a sensory impression, and a return message given, in the form of a motor discharge. A flash of light, for example, will be the signal; the subject is requested to press an electric key upon which his fingers rest, the instant he sees it. The time interval—some fraction of a second—is known as his "reaction time." Extensive studies have been made of the reaction times of various individuals in this manner—of piano players, prize fighters, marksmen, athletes, etc. Reactions to touch have been studied—also the sensitiveness of the skin in various parts of the body. Thus, a compass is spread and its points separated from one another a very small distance. The subject is then pricked, and he is expected to say how far apart the needle points are. His ability to do so depends largely upon the individual; but various parts of the body differ considerably in their ability to locate the pricks. The small of the back and the tongue can locate two distinct pricks with difficulty until the points are separated from one another an appreciable part of an inch, the hand and other parts of the body are, on the contrary, very sensitive.

More complicated reaction experiments are those which involve mental operations, such as the addition of a row of figures, the counting of colors, or remembering how many objects lie upon the table—they only having been exposed for the fraction of a second. By means of electrical self-recording apparatus, experiments have been conducted in the steadiness of control; the power of will, attention, the sensitiveness to heat and cold, smell and taste, in hearing, color distinction and blending, in color sensitiveness, feeling, memory, rhythmic action, etc. Studies have also been made of suggestion and expectation, of the emotions, which have been classified and analyzed; dreams have also been classified and analyzed, and so on. In short, mechanical apparatus has been employed in every department of psychology to obtain exact measurements of the interior mental life.

While much information has doubtless been derived in this manner, there are those who contend that its value is very limited, when applied to daily life. Certainly this method tells us nothing of the essence of mind, nor of the reasons or methods of its manifestations. It merely tells us the time limits within which certain thoughts and physiological reactions are

carried on. Its practical application to daily life, its uses, are very limited. Such experiments are of great value scientifically; but hardly warrant the years of work that have been devoted to this subject by group after group of experimenters all over the world.

Of more practical value and of great interest is Prof. G. Stanley Hall's voluminous work 'Adolescence'; which gives a minute study of the mental life, in all its phases, of children from puberty to manhood or womanhood. This monumental work gives, for the first time in any language, an organized and systematic study of the mind at this period of life, and its value to all parents and teachers is very great. Works devoted to childhood, the psychology of education, training, etc., have multiplied rapidly; and, within the past few years, several of importance have been published. Introspective analyses of mental life by adults have also appeared—both by those who are normal, and are more or less psychologists, and by those who were insane and recovered their faculties. Consult 'THE MANIAC,' by one who has been one, (London 1908); 'A MIND THAT FOUND ITSELF,' by Clifford W. Beers, (New York 1908). Marshall's exhaustive work on 'CONSCIOUSNESS' (1909) studies the mental life in great detail, and with considerable ingenuity.

Studies in the psychology of advertising have occupied a large place in the field of psychology,—its practical application, and bearing upon the problems of daily life ensuring a rapid spread of interest in this subject. Books have multiplied accordingly—many of which are good and helpful. Rev. J. A. Dewe's book, 'The Psychology of Politics and History,' studies these questions in considerable detail; and from a point of view hitherto neglected. Some of his remarks upon the mind of the masses are very good; and these parts may be said to be the most important contribution to this aspect of psychology since the publication of LeBon's 'The Crowd.' Dr. William McDougall, again, has written an extensive work on 'Social Psychology' (1909), in which the gradual growth of our individual and collective consciousness is traced back to our earliest ancestors. Various fantastic works, such, for instance, as Mrs. Annie Besant's 'Study of Consciousness,' need not be reviewed in this place, as, perhaps, without the field of orthodox psychology.

Various works upon the "psychology of sex" have recently appeared, in which the respective mental lives of man and of woman are analyzed. Typical of these are 'The Mental Traits of Sex,' by Helen B. Thompson, and 'The Alternate Sex: a Study of the Masculine Intellect in Woman and the Feminine in Man,' by Charles Godfrey Leland. Weininger's 'Sex and Character' is a most remarkable work of this sort, and, no matter whether its conclusions be accepted or not, it will doubtless live as a classic in its way. Recent studies of abnormal mental life have been numerous; some of the most important being Grasset's 'Semi-Insane and the Semi-Responsible'; Forel's 'Nervous and Mental Hygiene'; etc. Marsh's 'A Theory of Mind'; Bergson's 'Time and Free Will,' and James' doctrine of 'Pragmatism' are representative of the philosophico-psychological school. James' 'Varieties of Religious Ex-

perience,' and Harold Begbie's 'Twice Born Men' are important contributions to the psychology of religious phenomena; and Cutten's 'Psychological Phenomena of Christianity' gives a very clear historical summary of these phenomena throughout all ages.

A large literature has grown up within the past two or three years bearing upon "new thought" and practical psychology, as applied to every-day life. Payot's 'Education of the Will' is an excellent manual of this character—one of the few that are really scientific and practical in their handling of the delicate subjects with which the book deals. Dubois's 'Self-Control and How to Secure It' is a practical manual which should be helpful to Sunday-school teachers, and in other directions. The recent literature in this subject is immense.

A great deal of work has been devoted to a study of the subconscious mind; the problem having been attacked from various standpoints. A symposium on the subconscious was printed in the *Journal of Abnormal Psychology*, and has since been published in book form under the title of 'Subconscious Phenomena.' Jastrow's book, 'The Subconscious,' is devoted entirely to an analysis of this problem; which Myers, in his 'Human Personality,' attacked from a very different point of view. An important series of articles by Dr. Morton Prince on "The Unconscious" appeared in the *Journal of Abnormal Psychology*, but have not as yet been published in book form. In this journal will also be found important contributions to the psychology of Dreams, Hysteria, various states representing altered personality, the psychology of the lesser neuroses, etc. See ABNORMAL PSYCHOLOGY, DREAMS, ETC.

This question of alternating, or double or multiple personality, has lately attracted wide attention, owing to the fact that, in several cases of this character, the victims were forced to appear in court; and the legal inquiry naturally resulted in stimulating a wide popular interest in the subject. The lapses of memory have accordingly been studied with great care, and considerable space is devoted to this question in recent psychological literature.

Psychology, Animal. See ANIMAL PSYCHOLOGY.

Psychotherapy. Within the past few years great interest has been manifested in relation to psychotherapy, mind-cure, faith cure, Christian Science, Hypnotic cures, miraculous healings, laying on of hands, and in general, methods of healing the body by means of the mind. The foundation of the Emmanuel Church Movement, at Boston, has done much to stimulate interest and bring home to the layman the fact that many of his lesser troubles are of mental origin, and can be cured by mental means. In the public mind, however, all of these methods are confounded; and all systems which do not fall in line with the orthodox physiological treatment are classed together in one great package, labelled "mind-cure." To the public, all are equally *outré*. This is by no means the case, however, for, while some of them have a basis in scientific fact, as understood today, others can only be considered bizarre fancies, judged by the same standards. Let us consider each of these in turn.

In the field of hypnotism, (q.v.) much important work has been done, and several theories propounded—particularly the theory of Boris Sidis—of the "hypnoidal" state. Professor Dubois, of the University of Berne, has lately published a book, attacking the hypnotic theory, and advancing a method of his own—a system of psychic persuasion, in which the mind and will of the patient are appealed to,—without the necessity of putting the patient to sleep. Professor Forel and others have replied to the position occupied of Dubois, and the controversy at present rages with some bitterness.

An important book on the subject of psychotherapy, properly so-called, is that of Professor Münsterberg, who, in his book on this subject, defines the limits of suggestion, and the methods of modern science, according to the views of the orthodox scientist. It must be said, however, that Professor Münsterberg's views are by no means universally accepted by his psychological colleagues—his position that there is, strictly speaking, no "subconscious mind," *e.g.*, having called forth replies from more than one source. At the same time, it must be acknowledged that, these defects apart, Professor Münsterberg's work is important and enlightening.

Mind-cure and faith-cure are usually classed together with metaphysical healing. All these systems begin with the assumption that mind is all-powerful, that it can rectify an existing condition of mind or body, if only the faith and the will be strong enough. Most of these systems admit the existence of 'matter,'—though there is much contradiction on this point, as in practical application they seem to go on the assumption that matter is non-existent. There are various leaders in this field—each one having his own special following. Horatio Dresser and Ralph Waldo Trine are examples of one system of healing and teaching; Leander Edmund Whipple, of purely 'metaphysical' healing; Charles Brodie Patterson of another branch, and Henry Wood of still another. The books of the various authors referred to must be consulted in order to ascertain the fine distinctions which are drawn between one system of teaching and another.

The subject of Christian Science (q.v.) has been treated separately, and need not be referred to especially in this place. As is well known, the teachings of Mrs. Eddy consist chiefly in the belief that matter is non-existent; that matter cannot experience sensation, and that "spirit, mind, soul, God is all-in-all"; and consequently "sin, sickness, and death are non-existent—mere illusions of mortal mind." The pros and cons of the system have, however, been discussed under the article devoted to that subject.

As to the "laying on of hands," it is interesting to note that a building has been erected in Kansas City, Mo., for the express purpose of curing "spirit obsession"; and curing diseases of all kinds by the "laying on of hands," as in the Scriptures. The founder of this Institute—"The Temple of Light," as it has been called, is Dr. C. C. Carson—a spiritualist, who states he has undertaken the whole work at the suggestion of his wife, dead some years past, who has given him instructions through various "mediums."

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Because of its bearing upon mind-cure and Christian Science in particular, the publication of Professor Mars' book, 'The Interpretation of Life,' has special significance and interest. It attempts to show that the trend of philosophy has been towards idealism throughout the ages, and the author sees what he conceives to be the logical fulfilment of the tendency in the present system of Christian Science, with its denial of matter. The book—displaying as it does, a good knowledge of the history of philosophy, is a curious contribution to modern scientific thought.

Perhaps the most significant fact in this connection which has occurred in recent years is the reading of a number of papers on the subject of psychotherapeutics before the annual Therapeutic Society at its meeting held in New Haven, 6, 7, and 8 May 1909. These papers were subsequently published in the *Journal of Abnormal Psychology*, and republished in book-form under the title of 'Psychotherapeutics.' The contributors were all men of weight in the medical profession,—even of eminence,—comprising, among others, Drs. Morton Prince, F. H. Gerrish, J. J. Putnam, E. W. Taylor, Boris Sidis, G. A. Waterman, J. E. Donley, Ernest Jones, and Tom A. Williams. The subjects treated included 'Psychological Principles and the Need of Psychotherapy'; 'The Therapeutic Value of Hypnotic Suggestion'; 'Simple Explanation and Re-education as a Therapeutic Method'; 'The Treatment of Fatigue States'; 'Psycho-Analysis and Psychotherapy'; 'The Psychotherapeutic Value of the Hypnotoid State'; 'Obsessions and Associated Conditions in so-called Psychasthenia'; 'Psychoprophylaxis in Childhood'; 'The Relation of Character Formation to Psychotherapy,' etc.

This serves to show us that treatment by suggestion is now becoming a recognized branch of medical practice; and this joint report is probably the most important step that has been taken in this direction since 1898, when the subject of hypnotism was first brought up for discussion in the psychological section of the British Medical Association, and papers were read on the subject by Drs. J. Milne Bramwell, F. W. H. Myers, David Yellowless, John F. Woods, and Charles A. Mercier.

As to the miracles of Lourdes and "miraculous" healing generally, much of interest has transpired during the past few years. The alleged miracles of the grotto of St. Anne de Beaupre are still fresh in the mind, rivalling those of Lourdes in their number and character. So far, no detailed account of any of these cures has been issued by any competent medical man, however, and the cures rest on a very insecure basis, in many cases. As to the Lourdes cases, the book recently published by Dr. Georges Bertin, physician at Lourdes, gives an official summary of every case cured at Lourdes from Feb 1858 to 1 Sept 1904—a period of 46 years. During this period, his book says, there have been, in all, 2,642 cures of all sorts at the sacred grotto. These include 148 cases of diseases of the digestive system; 69, disorders of the circulation, 99 of the respiratory organs; 41 of the urinary organs; 95 of the spinal cord (medulla); 383 of the brain; 96 of the bones, 128 of the joints; 105 of the eyes; 29 of the ear; 1 of the nasal cavities, 31 of the skin; 45 diseases of the

uterus and appendages; 571 tuberculosis; 5 acute diseases, 69 tumors; 1 foreign bodies in the body (finger); 181 nervous disorders; and 299 minor diseases of various sorts. This is an imposing list, but when one considers the thousands of sick and suffering who travel to Lourdes every year, in search of health, ready to believe in the miraculous powers of the water; when we stop to consider that, in all this time,—nearly half a century,—among all these thousands of cases, there have been, to date, only 11 cures of lameness, 48 of dyspepsia; 9 of asthma, etc., the impressiveness of the total shrinks; and the wonder is, not that so many have been cured, but that, amidst so many, so few have received permanent benefit. The greatest total is tuberculosis (571 cases); but of these, how can we be certain that a large percentage really had consumption at all; and what assurance have we that they were not, in reality, various simple diseases of the lungs,—diagnosed at the time as tuberculosis, and benefited temporarily or permanently by the waters and the mode of life adopted at the cure?

At the same time, it must be admitted that a number of cures cannot be explained in so easy a manner. Only recently, Monsignor Amette, the Archbishop, has given his canonical judgment on five recoveries "due to the intercession of Our Lady of Lourdes." These five cases were all studied by a committee appointed 1 June 1907, by the late Archbishop Cardinal Richard. The committee examined the evidence, medical and other, and concluded, first, that the subject was suffering from the disease alleged; second, that the cure was instantaneous; and third, that the cure had proved permanent.

All five of the cases were women. One suffered from a sore on the right leg, from which she has suffered three years; one of tuberculosis and ulcers; another from tuberculosis; another of tuberculosis peritonitis; and other of inflammatory oedema.

After a careful examination of all the evidence, it was concluded that these cures were "miraculous"; and the testimony of the physicians who attended them was adduced in support of this dictum.

Still more recently, a great sensation was caused in New York,—at the Church of St. Jean Baptist,—when a number of cures were apparently effected over the relics of St. Anne, placed on exhibition there, and applied by priests to those who appealed to the saint for relief. Numbers of patients left their crutches at the altar; and, in some cases, it was asserted that blindness and deafness were cured, and other diseases alleviated. As yet, however, no official report has appeared, signed by a medical man; and there is reason to think that some of the cures represented rather the will and faith of the sufferer than an actual cure of a bodily disease. This the papers seemed to indicate at the time. At all events, it is certain that many cures have been effected in the past by such means; and it is also certain that the explanation is, in many cases, lacking, and that the cures cannot be interpreted according to the present system of medical science. The subject of psychotherapeutics and mind- and faith-cure in general is certainly attracting wide attention; and, while much may be said against

PUBLIC HEALTH ASSOCIATION—PUBLIC SERVICE CORPORATIONS

some of the extravagances connected with certain aspects of the system, it has doubtless done much real good; and will continue to do more and more good as the years elapse.

Public Health Association, American.

The annual meeting of the association was held at Milwaukee, Sept. 1910, when the applications of 171 persons for membership in the association were favorably acted on. The most important action taken at the Milwaukee meeting was the creation of a section on sociology. A "section" of the association represents a group of members devoting their time and attention to the study particularly of one branch of public hygiene, and the sociological section will demand the interest of those members who are especially interested in sociology in its relations to public health. In view of the growing importance of engineering, in its relations to public health, the association authorized, provisionally, the organization of a section on sanitary engineering. The association provided at the Milwaukee meeting, for the publication of a monthly journal, beginning Jan. 1911, to be known as the *Journal of the Public Health Association*.

Public Option Law. This is the system by which the voters give expression to their view on various subjects. Some call it "the advisory system" of government. The public opinion law is, therefore, close to the initiative and referendum. Illinois has the best known statute on the subject. Belleville in that State has a separate act of its own. The public opinion law is also in operation in Detroit, Buffalo, Winnetka, Illinois, and Geneva in the same State. An elaborate act for a public opinion system was introduced in the New Jersey Assembly 1 Feb 1909, and referred to the committee on judiciary. The Illinois law was enacted 11 May 1901. The act provides "for an expression of opinion by electors on questions of public policy at any general or special election." Any question of public policy petitioned for must be submitted at a general or special election upon the written petition of 25 per cent of the registered voters of any incorporated town, village, city, township, or school district; or 10 per cent of the registered voters of the State. The question submitted shall be printed in plain, prominent type upon a separate ballot, the same as constitutional amendments or other public measures that the people vote upon. The first petition filed had 109,418 signatures covering the questions of municipal ownership of gas, electric light, and direct nominations; the second had 146,134 signatures and dealt with the initiative and referendum, and the direct election of United States Senators; the third petition, having 131,417 signatures, dealt with the immediate municipal ownership of street railways, police power licenses, and good service instead of franchises and direct election of the Chicago School Board. Figures of the last election of this character show that out of 180,000 voters who went to the polls in the city precincts of Chicago, from 115,000 to 145,000 voted on each of the propositions. The public opinion system is merely an entering wedge. It makes possible the installation of any measure by a majority vote, while should a temporary defeat occur the same measure can be carried into the

next campaign and made a paramount issue. As a State remedy, it is possible to be installed before the initiative and referendum, which requires a constitutional amendment. The system of making the public opinion law effective is to require all candidates to pledge in writing that they will obey the will of their constituents when expressed by a referendum vote. Under the proposed law in New Jersey, when 10 per cent of the voters, calculated upon the basis of the last vote for governor, shall petition the legislature for the passage of any measure, the latter, as proposed by the petitioners, shall be numbered and printed, indorsed "introduced by initiative petition," and shall take the same course as other bills and resolutions. If the measure is defeated or vetoed, the question of adopting it shall be submitted to the voters of the State for an expression of opinion. The Legislature or either a majority of the Senate or Assembly can order a competing measure to be submitted and the voters may express their choice or vote against both. If either measure receives a majority at the polls the Secretary of State must present it to the Senate and General Assembly together with a statement of the vote cast and the Legislature must vote upon it again. Under the public opinion ordinance of Belleville, Ill., every petition to the city council proposing an instruction to a public official and signed by at least 5 per cent of the registered voters of the city, shall be received and referred to a committee, testimony shall be taken and the measure reported back, together with such amendments, substitute or recommendations as is thought best; and a ye and nay vote taken, after which the measure as originally introduced together with the amended measure, substitute or recommended measure, shall be submitted to an advisory vote of the registered voters of the city.

Public Service Corporations. Census Director Durand, in his report on the statistics of cities having a population of 30,000 and over in 1908, presents a table showing by cities the municipal receipts from all privately owned public service corporations, except steam railroad companies, which enjoy special uses or privileges in the streets and highways.

The receipts exhibited include only those collected and retained by the cities as part of their revenue. Some cities pay over to the county and State a portion of the money collected from these corporations, and in some others the corporations pay taxes or franchise dues to the State only or to the State and county in addition to those paid to the city.

The corporations included are principally street railway companies, light, heat, and power companies, telephone and telegraph companies, water companies, and those operating toll bridges or ferries.

Data are given for all of the 158 cities covered by the report except New York City, Detroit, and East St. Louis.

From taxes, licenses, and public service privileges of public service corporations, Chicago received \$4,506,516, or more than three times the amount reported for any other city. The street railways alone contributed \$3,024,363 of this total, and light and power companies \$1,447,243. In addition to Chicago the

PUBLIC TRUST FUNDS—PUBLIC UTILITIES

following cities reported receipts from these sources in excess of \$500,000. Boston, \$1,350,683; St. Louis, \$1,258,508; Baltimore, \$1,195,743; San Francisco, \$514,644; Cleveland, \$531,651 and Cincinnati, \$523,558.

In addition to these receipts some cities received money from public service corporations as reimbursements for payments made by the cities in connection with street sprinkling, cleaning, or repairing. Philadelphia was paid \$499,785 by its street railway system for reimbursements, while Chicago received \$164,843 from its public service corporations for this purpose. No other city received in excess of \$100,000.

In this report the Bureau of the Census endeavors to make a comparison between the value of salable public properties in cities and the outstanding debt incurred in the acquisition or construction of such properties. The properties included consist of land, buildings, and equipment of departments; lands, buildings, and equipment of municipal and public service enterprises, and miscellaneous real property.

The total estimated value of these properties in 1908 was \$2,738,199,000 and the debt outstanding against them approximately \$1,213,080,000. The ratio of debt to value was, therefore, 44 per cent. The ratio of outstanding debt, issued for land, buildings, and properties of departments to the present value of such land, buildings, and properties, was 42 per cent; the corresponding ratio for municipal service enterprises was 41 per cent, and for public service enterprises, approximately 57 per cent. From all the facts considered, the inference may be drawn that somewhat more than one-half of the reported valuation of all municipal properties has already been paid for by the cities from revenues received.

Of especial interest is the ratio between debt incurred for water-supply systems and the reported valuation of such systems. The valuation reported for 1908 was \$690,000,000, and the debt outstanding \$312,000,000, or 45.2 per cent of the valuation. The corresponding ratio for 1907 was 43.6 per cent. The ratio between the debt of the water-supply system of New York City and the valuation of the system was 60.7 per cent. Over one-fourth, or 26.9 per cent, of the total debt incurred for this class of public service enterprises is shown for this city. The debt outstanding against the water-supply systems of San Francisco, Cambridge, and Atlantic City is in excess of their valuation. See PUBLIC SERVICE COMMISSIONS; PUBLIC UTILITIES LAW.

Public Trust Funds. Entering into the accounts of cities are certain funds the principal of which has been donated to the city, and the income of which is to be expended for the benefit of the citizens in some specified manner. If the expenditure is for an object for which the city authorities may lawfully make appropriations, the fund is called a public trust fund for municipal uses, and if not, one for nonmunicipal uses.

Public trust funds for municipal uses are established for objects of charity, education, pensions, and other public benefits. Of the 158 cities having a population of over 30,000 in 1908, 112 reported 574 of these funds. Of these funds 141 were for pensions of city employees, 123 for libraries, 109 for charities,

106 for education, 39 for hospitals, and 56 for other objects. The assets of these funds at the close of 1908 amounted to \$64,288,086, of which \$55,958,839 was reported by cities of over 300,000 population. The assets in Philadelphia amounted to \$28,367,317, in Chicago to \$13,571,197, in Boston to \$3,099,339; in St. Louis to \$2,811,021; in New York to \$2,465,203; and in Cincinnati to \$2,032,081.

The assets of the Girard funds in Philadelphia, the income of which is applied to charitable and educational objects, amounted to a total of \$25,673,000.

Public trust funds for the use of libraries are usually for the purchase of books. Of the 123 funds for libraries, 34 were in Boston, Mass.

Trust funds for charitable uses are most numerous in Philadelphia, Boston, and Salem; those for education, in Boston, Chicago, Philadelphia, and Cambridge. All of the 39 hospital funds were reported by cities in Massachusetts, 17 being in Boston and 17 in Worcester.

Of the total assets of these funds, \$15,167,867 consisted of investments in the securities of the cities reporting the funds, \$45,663,752 of real estate and securities of their own city and of other cities, and \$3,444,467 of cash. The receipts from interest and other earnings amounted to \$3,417,017, which is equivalent to a return of 5.38 per cent on the average amount of assets held during the year.

Public Utilities. The drastic regulation of public utilities is becoming the policy of an increasing number of States. The day of commissions, clothed solely with the power to recommend and not enforce, is of the past. During the last three years, the idea has gained wide acceptance that a public service corporation, which owes its existence to the State and thrives upon a franchise given by the State or local governments is not a private business and should, therefore, be subject to government regulation in so far as its dealings with its patrons and the general public are concerned. During 1910, Maryland and New Jersey, following in the wake of New York and Wisconsin, created public utility commissions. In Maryland, there is the court review provision to be found in the Wisconsin law. The New Jersey act gives the commission jurisdiction over telephone companies as well as all other public utilities. It even makes the granting of franchises dependent on the approval of that body. There were important changes made in the public utilities law of New York. The jurisdiction of the commission was extended over telephone and telegraph companies and the commutation rates of railroads. This extension of power had been asked for by Governor Hughes at the 1909 session, but it was not until the next one that it was granted. Telephone and railroad commutation rates have long been a matter of dispute in New York, and this largely inspired the governor to recommend that the Public Utilities Commission have jurisdiction in the matter.

The Public Utilities Law of New York went into effect on 1 July 1907. It was the first important measure asked for by Governor Hughes and only passed both houses of the Legislature after a spirited contest in which the Governor, himself, took part, by arousing public sentiment in the subject. No better

explanation of the reasons for the law has been given than that of William M. Ivins, the special counsel for that body in the first district. In an article in *The Century*, he stated that the act was intended to accomplish the following: (1) To prevent wrongs in overcapitalization, and in the issue of corporate securities; (2) to prevent monopoly by making it impossible for one corporation to hold more than 10 per cent of the stock of another; (3) to secure the efficient control of corporate accounting, bring about publicity on the subject and end the practices of public service corporations of keeping books that fail to represent their true condition; (4) to compel an adequate and honest product at fair and reasonable rates, without discrimination among users or consumers; (5) by investigation, to throw the light of publicity on the operation of those kinds of business which the interest and welfare of the community is a primary consideration; and (6) to secure the safety of the general public. Under the New York law, there are two commissions: one for Greater New York, the first district, the other for the rest of the State. The original act placed all transportation, gas, and electrical companies within the borders of the State under the jurisdiction of the commission. It has the power to make their rates reasonable, and prevent discrimination. The safety and adequacy of the service are also within the jurisdiction of the board. It also may require that the accounting methods of public service corporations be uniform and the books kept so as to reveal their actual financial condition, and that their capitalization represent present values instead of future. A most important work of the commission for Greater New York has been the laying out and construction of the subways under contemplation. More than half the time and 70 per cent of the expenditures of the commission have been devoted to it. The commission in the First District has been giving consideration to 10,000 complaints annually. The method of procedure in such cases is simple. Every complaint received is acknowledged and forwarded to the company against which it is made with a request that the cause be removed within 10 days or an explanation sent to the complainant and the commission. If the explanation is not satisfactory, the matter is investigated by the experts of the commission. Upon their report, recommendations are made. This, however, is often only a preliminary step. For if any side should be dissatisfied with the recommendations, a hearing must be held. Where the matter is of great importance, the hearing is public. The commission then renders final decision. It will either dismiss the complaint or serve an order on the company to comply with it, which order also gives a time limit. The penalty for disobedience may be as much as \$5,000 a day in the case of a transportation company, and \$1,000 for a gas and electric. Of the complaints received, one-third are usually settled amicably. In about one-quarter of the cases, they are usually found to be trivial or baseless. Many of the complaints considered in the First District related to the overcrowding in the subway. The experts of the commission made an investigation. An important result was the lengthening of the station platforms to en-

able the running of more trains. Some minor orders on the subject were the providing of guards to help load and unload the cars, side doors on express trains, a speed control at express stations in order to allow the trains to follow each other with greater rapidity and better electric light for the illumination of the cars. For the prevention of accidents, the surface cars were ordered equipped with fenders and wheel guards of the type found by experts to be the most effective. As a result, whereas for 1907-08, 508 persons were fatally injured by the roads, the figures for the following year showed a decrease of 128, or 30 per cent less. A most important work of the commission in the First District has consisted in passing on applications of corporations for the issuance of securities. An early one was that of The Interborough Rapid Transit Company. It asked leave to execute a mortgage for \$55,000,000 in order to pay certain notes then coming due. The commission granted the application, upon the company including in the mortgage, its interest in the elevated railways as well as the subway. When the Coney Island and Brooklyn railroad made application to issue bonds for \$372,000 in order to make certain improvements, the commission made an investigation and found that a large part of the funds were to be used for mere replacements instead of actual improvements and only to offset depreciation; that this depreciation should be met by a fund created from annual earnings. It finally allowed a bond issue of \$107,000 and ordered that the bonds be sold for not less than 80.

The Wisconsin law differs from the New York law in two features. It requires the commission to value all the property of every public utility actually used and to publish the value of the physical property along with the value of all the property. It also places plants owned by municipalities under the same regulations as those of private corporations. Their method of accounting is the same and they must go to the commission if they desire to raise rates. The physical valuation is the most important feature of the Wisconsin act. For this purpose, there is a staff of scientific investigators required to investigate and ascertain for each public utility what is the reasonable value of the service it renders to the public. The company is obliged to submit all its evidence to that body and only on what it submits can it go into court and seek a review of the findings. No settled rules of evidence guide the commission in its work. It can consider any document, writing or statement that bears on the subject. An important decision on the subject was the overruling of the contention that value meant power over others and was based on stocks, bonds, or capitalization of net earnings. Like the New York body, the commission has paid much attention to gas meters with the result that they are now on a more accurate basis.

Publishers Association, Directory. See DIRECTORY PUBLISHERS ASSOCIATION

Publishing, 1910. The book production of the United States for 1910 passed all records, exceeding even the high water mark of 1909, and placing us close to the head of the book producing countries of the world. Though there have been few books of preeminent merit

PUGILISM—QUEBEC

the level of excellence has been uniformly high. The following figures sum up the production of books in various countries American publications, 1909 (including new editions)—Fiction 1,098; theology and religion, 903; useful arts, 775, literature and collected works, 1,136; medical hygiene, 756, juvenile, 712; poetry and the drama, 671, political and social science, 628; physical and mathematical science, 620; law, 591, biography, correspondence, 563; history, 542, description, geography, travel, 474; education, 467, fine arts, illustrated gift books, 269, domestic and rural, 204, philosophy, 197, works of reference, 113, sports and amusement, 109, humor and satire, 73. Total 1909, 10,901; total 1908, 9,254, total 1907, 9,620, total 1906, 7,139; total 1905, 8,112; total 1904, 8,291; total 1903, 7,856, total 1902, 7,883, total 1901, 8,141; total 1900, 6,356, total 1899, 5,321, total 1898, 4,886; total 1897, 4,928. Of the production of 1909, there were 8,308 books by American authors. British publications 1909 (including new editions)—Religion, philosophy, etc., 1,022; educational, classical and philological, 629; fiction, juvenile works, etc., 2,881, law, jurisprudence, etc., 243; political and social economy, commerce, etc., 752; arts and sciences, 1,201, voyages, travels, geography, 533; history, biography, etc., 913; poetry and drama, 475, year-books and serials in volumes, 517; medicine and surgery, etc., 347, belles-lettres, essays, etc., 304; miscellaneous, including pamphlets, 908. Total 1909, 10,725. German publications, 1908—Bibliography, etc., 649; theology, 2,566, law, etc., 3,032; medicine, 1,785; natural sciences, etc., 1,754; philosophy, etc., 712; education, etc., 4,203; language, etc., 1,772; history, 1,317; geography, 1,436; military science, 703; commerce, 2,047, architecture and engineering, 1,074; domestic economy, agriculture, 1,007; popular literature, 4,162; art, 903; year-books, 617; miscellaneous, 578. Total 1908, 30,317. French publications, total 1908, 8,805.

Pugilism. See SPORTS, BOXING.

Pullman Car Rates.—The Interstate Commerce Commission after an exhaustive examination of the charges made by the Pullman company for berths in its cars, ordered a cut in prices which will make a difference in the earnings of the company of \$1,500,000 yearly. The company was also ordered to charge 20 per cent less for upper berths than lower berths. Only three main line roads, the Great Northern, the New York, New Haven and Hartford, and

the Milwaukee system do not use cars operated by the Pullman company and are not affected by the ruling. The reduction was based on an average of \$2 a day for a berth. The reduction is shown in the rates out of New York: to Chicago, \$3.75 instead of \$5, to St. Louis, \$4.50 instead of \$6; to Washington, \$1.50 instead of \$2; to Atlanta, \$4.15 instead of \$5.50. The new schedule was ordered to be in effect 20 Jan 1911.

Punishment, Capital. See CAPITAL PUNISHMENT.

Pure Food Act. See FOOD LEGISLATION.

Purity Movement. Lessons upon purity and the social evil should be taught in the public schools, according to letters from Charles W. Eliot, president emeritus of Harvard University, and John D. Rockefeller, Jr., which were read at a conference held at Chicago in Sept. 1910, by members of the Illinois Vigilance Committee, the Midnight Mission of Chicago, and the American Purity Federation. The conference was for the purpose of meeting the members of the Purity Federation, who made a 30-days' tour of the West and South, and to exchange ideas regarding social problems. At each stop of the delegation lectures were given and literature distributed. They went to Minneapolis, thence to Winnipeg, where they divided into two parties for work through Canada, joining again at Seattle. In his letter Doctor Eliot said: "In my opinion, the social evil and the diseases incident thereto ought to be publicly discussed, so that feasible remedies may be decided upon and applied. I am entirely convinced that the policy of silence upon these subjects has failed disastrously." Rev. Francis E. Clark, founder of the Christian Endeavor movement, in opening at Sagamore Beach, Mass., a conference on the moral and religious training of the young, declared that flagrant immorality existed in the public schools and that it was a well-known fact that in some of the colleges even gross immorality, drunkenness and lechery are no bar to a degree if only examinations can be passed and percentages of scholarship are barely tolerable. "The supreme reason for calling this conference is its supreme need," said Doctor Clark. "Every right-minded American believes that good morals should be taught as well as arithmetic and geography."

Pyrometer. See ASTRO-PHYSICS.

QUAKERS. See FRIENDS, SOCIETY OF. Quebec. The French Province of the Dominion of Canada, and the battleground of Franco-Anglican strife when Canada's infant history was making.

Area and Population.—The Province of Quebec is about 346,930 square miles in extent, and the population over 1,620,000. The majority of the inhabitants are French-speaking Quebec, the capital, is situated on a gigantic rock overlooking the St. Lawrence; population 78,000. Montreal is the largest city of the province, and of the Dominion. It has 390,000 inhabitants. Other important towns are: Sherbrooke, 15,000; Three Rivers, 8,350; Hull, 17,000; St. Hyacinthe, 10,000; and Levis, 7,300.

Government, Religion, Justice, and Education.—There is a Lieutenant-Governor, assisted by a Legislative Council of 24 members (appointed for life), and a Legislative Assembly of 74 members, elected for five year terms of office. The Premier of Canada and many of the country's ablest politicians are natives of Quebec, and of French descent. The province is democratic in all its ways. The revenue for 1908 amounted to \$6,081,500; expenditure, \$5,095,000; debt \$3,785,000. The prevalent religion is Roman Catholicism, there being 1,429,250 of that faith in the 1901 population; communicants of the Church of England in that year numbered 81,550; Presbyterians, 58,000; Methodists, 42,000; Baptists, 8,500. The ad-

ministration of justice is effected through the tribunals common to Canadian provinces. The education grant from the Government amounted in 1908 to about \$965,000, being second only to that of Ontario. In said year there were 6,500 schools (100 more than Ontario), with 12,000 teachers, and 360,500 pupils.

Industries and Commerce.—New land open for settlement in the province in 1909 amounted to about 6,238,000 acres. Grain is an important agricultural product. Wheat raised in 1908, 1,424,000 bushels; oats, 35,478,000, and barley, 2,170,000 bushels. Land devoted to these products, about 1,757,600 acres. The forest area covers 120,000,000 acres, about one-third of which is under immediate or prospective operation. The wood-pulp industry is of great and increasing importance. The fisheries in 1907 were the source of about \$2,095,000 worth of products. Mining and stockraising are both important in Quebec. There were in 1906 about 1,400 cheese factories, and 630 creameries, together with other dairy concerns. Manufacturing establishments in 1905 numbered 4,965, employing 119,000 individuals, paying wages and salaries amounting to \$47,160,500, and producing goods to the value of \$219,861,650. Commerce with United States is brisk, but the trade, of course, is chiefly with Great Britain.

Communications.—Ocean steamers sail down the St. Lawrence as far as Montreal, at which port the shipping in 1905 consisted of about 1,228,200 tons entered, and 1,256,900 tons cleared. The railways of the province are extending. Montreal is now only 18-days' journey from Yokohama, via the Dominion railways and a government line of Pacific steamers. Postal, telegraphic, and telephonic services are first-class. The province enjoys full benefits of "civilization" as defined in America. In the Dominion of Canada, Quebec takes second place, Ontario ranking as the first province.

Queensland. A colony (prior to 1859 part of New South Wales) in the north-east of Australia. The area is about 670,500 square miles. At the close of 1909 there were about 578,550 people in the country; an increase of more than 75,000 since the census of 1901. In that year there were 68,600 English-born people; 37,650 from Ireland; 19,950 from Scotland; 24,850 from New South Wales; 13,150 from Germany, and many Australian born. There were 9,300 Chinese; 9,300 Polynesians; 2,250 Japanese; etc. The chief town is Brisbane, 143,100 inhabitants; other towns are Rockhampton, 19,700; Maryborough, 12,900; Townsville, 15,500; Ipswich, 15,250; Toowoomba, 14,000.

Government and Finance.—In accordance with the provisions of the "Electors Enact Amendment Act of 1905," 88,500 women voted in 1908. Those who reside in the colony 12 months become duly qualified electors. Under the administration of aldermen and councillors there are 160 subdivisions of the Government. The Legislative Assembly in Queensland has 72 members, popularly elected; the Legislative Council is composed of 45 members, who are nominated by the Crown for life. The regulation of laws and taxes rests with the Parliament. At the head of the Government stands a Governor, assisted by a Premier and a Ministry. The revenue for 1909 amounted to about

\$23,811,000, and the expenditure of the Government to about \$23,448,500. At the end of that year the public debt amounted to \$202,648,000. The chief local sources of revenue for 1909 were about as follows: stamp duties, \$945,000; income tax, \$1,365,000; licenses, \$300,000; rentals and sales of land, \$3,400,000; railway receipts, \$10,550,000. About 200 Government savings-bank branches had deposits aggregating \$24,396,800.

Justice, Education, and Religion.—There are a Supreme Court, District Courts, and minor courts of justice; justices of the peace officiate in the latter. Total convictions in 1908: 290 in the Superior Courts; 15,775 in the lesser courts. Schools for elementary instruction in 1908 numbered 1,100 with 2,410 teachers, and an attendance of 67,300. There were 10 grammar schools (secondary instruction) in 1908, with 85 teachers and an attendance of nearly 1,000. Private schools in the same year had 11,930 pupils. Technical schools exist. The Government lends assistance to the grammar schools. The denominational population in 1901 was as follows: Roman Catholics, 120,650; English Church, 185,000; Presbyterians, 57,600; Wesleyans, 29,800; Lutherans, 25,500; Baptists, 12,250; Jews, 750; Mohammedans, etc., 19,100; etc.

Agriculture, Industry, and Trade.—About 15,108,450 acres of Crown lands have been disposed of, and 6,200,930 are under disposition. For grazing and pastoral purposes 232,761,350 acres were leased in 1908. Land under cultivation in the same year, 650,475 acres, mostly devoted to crops of wheat, oats, and barley. Sweet potatoes are raised, coffee, cotton, oranges, peaches, pineapples, grapes, bananas, coconuts, mangoes, plums, etc., are grown. The leading articles of production, however, are wool, meat, butter, sugar, and gold. The mine-products are, besides gold, coal, tin, lead, copper, silver, antimony, limestone, ironstone, wolfram, etc. The forests of Queensland are productive of valuable woods. Stock-raising is a great industry. In 1909 there were 555,600 horses; 4,711,800 cattle; 19,593,800 sheep; and 124,800 swine. The principal exports in 1909 were as follows: wool, (approximately) \$24,000,000; gold, \$9,550,000; livestock, \$8,450,000; meat, etc., \$5,500,000; sugar, \$5,600,000; hides, \$3,735,000; fruit, \$650,000; butter, \$2,705,000; tallow, \$1,510,000; copper, \$3,950,000; timber, \$500,000; silver, \$470,000; pearl and tortoise shell, \$315,000. The total value of imports (which include a great number of manufactured articles) in 1909 was about \$49,665,000, and of the exports about \$72,365,000. Considerable trade is carried on with the United States. Shipping and Communications. Vessels entered at the port of Brisbane in 1908 represented a tonnage of 2,015,600 (approximately), British shipping preponderating. About 830 sea-going vessels entered the ports in 1909. At the close of 1909 there were 3,530 miles of Government railway working. The cost of construction had been more than \$110,056,000. The receipts for 1908 aggregated about \$9,750,000, and the expenditures amounted to about \$5,250,000. Passengers carried in 1908 numbered 10,419,800. There were, in the above year, 1,400 post-offices in the country. There were in 1908, 10,400 miles of telegraph line.

Quigley, James Edward, American R. C. Archbishop: b. Oshawa, Canada, 15 Oct. 1854.

He was graduated from St. Joseph's College of Christian Brothers, Buffalo, N. Y., in 1872, attended the seminary of Our Lady of Angelo, (now Niagara University) Niagara, N. Y., the University of Innsbruck, Austrian Tyrol, and was graduated from the college of the Propaganda, Rome, D.D. 1879. He was ordained priest by Cardinal Monaco della Valletta, 13 April 1879, and was pastor of St. Vincent's

Church, Attica, N. Y., 1879-84; of St. Joseph's Cathedral, 1884-96; St. Bridget's Church, Buffalo, N. Y., 1896-97. On 24 Feb 1897 he was consecrated bishop at Buffalo, Archbishop Corrigan being the consecrator assisted by Bishops McQuaid and McDonnell, and on the death of Archbishop Feehan, 12 July 1902, he was appointed Archbishop of Chicago and immediately assumed charge of the archdiocese.

RABIES. See HYDROPHOBIA

Races, Congress Universal. It has been announced that a Universal Races Congress is to be held in London, July 1911. The purpose of the plan is "to discuss in the light of modern knowledge and the modern conscience the general relations existing between the peoples of the West and those of the East, between so-called white and so-called colored people." The result hoped for is a friendlier feeling, a heartier cooperation, and a better understanding. Now even the dominant white races, says one observer, have begun to feel some qualms of conscience and doubts as to their ability to regulate conquered distant provinces. The difficulty seems to be that, while it is easy to rebuild wasted cities, to refinance a country, enlarge its crops, and to introduce modern sanitary and police methods, the beneficiaries decline to become or to remain content. Good government refuses to satisfy them, and the reason is that it is not their government. So whether the colonizers are American, German, British, or French, the dissatisfaction grows the longer the overlordship continues. It is not only those who are being forcibly uplifted whom the congress will include. Japanese and Chinese, Turks and Haytians, are as well to be represented in the effort to smooth out racial misunderstandings. The awakening in Japan and India alone has had a powerful influence on the chancelleries of Europe. The phrase "mastery of the Pacific" conceals a struggle, in the minds of some, that will convulse half the globe. It is felt that now therefore is the time that the humane relations of the peoples of the globe should be cultivated. Essentially the congress is to be non-political. Questions of a pressing nature are to be avoided. Americans, it is pointed out, have a peculiar interest in such a congress, for nowhere is the problem of black and white so pressing.

Radium. The most important step that has been taken in many years was taken when Madame Curie (q. v.) succeeded, at last, in isolating radium and obtaining it in a pure state. For years, this had been attempted, but never before had it been obtained pure—radium salts being the state in which this metal had always before been obtained, and all experiments in radio-activity had been conducted with this impure material. Partly for this reason, partly because of her past work in this field, it has been decided to call the standard unit for measuring radium emanations, "the curie." This is important for more than one reason. Owing to the rapid decomposition of radium salts, with loss of weight and consequent increase in the proportion of radium present in the various salts, (which until now have been all that could be obtained) it is probable

that some of the standards adopted are too high, and that the salts contain more than the calculated amount of radium, while on the other hand many of the standards are entirely untrustworthy,—50 per cent and even 20 per cent preparations having been sold as "pure."

By the acceptance of "the curie," the first step has therefore been taken towards the standardization of radium. The new unit expresses the amount or mass of radiation emanation in equilibrium with one gram of radium element. The standard will contain 20 milligrams of radium,—which will cost about \$2,500, and a similar amount will be needed for sub-standards. The millicurie, for instance, would be the amount of emanation in equilibrium with one milligram of radium element.

The price of radium has, of late, fallen somewhat—though still exorbitant. At the present time radium costs about \$2,100,000 an ounce. It has until recently been \$400,000 an ounce higher than this. This is due, in part, to the fact that a short time ago, 500 milligrams of radium were produced in England from Cornish pitchblende. It is hoped that a continuous supply of radium will be obtained in the future from English shores. Up to this time, the majority of the radium in the world has come from Austria.

Of late, attention has been called by Sir William Ramsay to the possible curative powers of radium, especially in cancerous growths. The results, so far, seem to be contradictory. Undoubted relief was experienced in a number of cases; the tumors diminished in size and in some cases disappeared altogether. As in the case of the X-Ray treatment, however, some of these cases have since been found to relapse. In other cases, no great improvement was noted.

The gamma rays from radium are still a mystery, to a certain extent. They cannot be bent with a magnet,—like the alpha and beta rays,—and they are able to penetrate matter usually considered opaque. For this reason they are like X-Rays (q. v.), but can penetrate even more solid matter; thus, they will pass through a foot of solid iron or several inches of lead. They seem to be neutral electrically, and they are seemingly the agent chiefly concerned in the physiological action of radium. They also effect a photographic plate. Thus they appear to be, if not X-Rays, at any rate closely akin to them in their properties and characteristics.

Early in November the Austrian Institute for Radium Research was opened. A fine building had been erected, at a cost of about \$100,000,—the entire cost being defrayed by Dr. Carl Kupelweiser. It is, however, the creation and property of the Academy of Sciences.

The new Institute adjoins the physical Institute of the University and is equipped with the most modern appliances and instruments. It promises to become the center of radium

RADIUM

research for the world, as Austria possesses in the springs in the Joachimsthal and at Gasstein the richest sources of radium so far discovered. It is dedicated to International research, and several distinguished foreign scientists have already secured places for work in the laboratories.

The Academy of Sciences is giving its new Institute an excellent start in the shape of a present of three and one-half grammes of radium, worth at the present market rate, some \$265,000. Of this quantity, one and one-half grammes, forming the so-called "head," consist of an intensely powerful preparation with most aggressive properties, so that the investigators will have to handle it with the greatest care in order to safeguard themselves against injury.

While the atom may conveniently be considered the unit in the subdivision of matter, it can not, at the present day, be considered the smallest particle of matter, for it is resolvable into other, smaller particles. The atom is the seat of a strong electric field. The idea of 'reaction' has also been added to this theory. When certain substances are exposed to the action of actinium salts they acquire a radio-active deposit of actinium A, B, and C, which is quickly disintegrated, as a glance at the actinium table will show. It has been repeatedly observed, however, that in these cases a small remnant of radio-activity persists for a long time. If the experiment is performed in an electric field, the residual activity is greatly increased and may amount to one fourth of the initial activity. Professor Henrich, in a recent article in the *Scientific American*, says —

"Hahn has shown that this initial activity is due to actinium X. Now, how could actinium X, which is a solid, be carried from the actinium salt to the body displaying induced radio-activity? Between radio-actinium and actinium X, in the series, neither a gas at high pressure nor a short lived emanation, has been detected. A satisfactory explanation is given by the assumption that radio-actinium disintegrated explosively into actinium and one alpha particle per atom, and that the separation is so violent that the actinium X experiences a reaction, which is sufficient in some cases to eject it from the molecule. In a negative electric field, the nascent positively charged atoms of actinium X would be freed from the molecular bonds still more readily. Rutherford has obtained similar results with radium. . . . This phenomenon of reaction provides a new method of discovering and separating radio-active substances. By this method thorium D has been discovered and actinium C can be separated more easily than by chemical methods."

It is only comparatively recently that the direct parent of radium—ionium—has been discovered. Boltwood has shown that it is chemically very similar to thorium; it emits alpha rays of less than 12 inch range, and becomes converted into radium at a uniform rate. Ionium can now be separated from the rare earths and other mixtures—this method having been discovered by Keetman.

Considerable progress has been made in the study of radium emanation, which is one of the most important of radio-active substances. Rutherford, and also Ramsay and Gray, have condensed the emanation into liquid and solid forms. The liquid emanation is colorless, but emits a faint bluish green phosphorescence. A

tube covered with cotton wool, and filled with the emanation may be sprayed with liquid air, and in this way a solid of blue metallic sheen is obtained.

Attempts have been made to make use of the tremendous energy possessed by the radium emanation. Ramsay conducted a series of experiments in which lithium and argon were obtained by the action of the emanation of aqueous solutions of copper sulphate and copper nitrate. Mme. Curie and others attempted to repeat his experiments without success, and suggested that his results were due to an error in experiment. Ramsay, however, stated most emphatically that such was not the case, and produced evidence for the transmutation of thorium, lead, zirconium, titanium, and silicon, into carbon, a member of the same group of elements. The error in this experiment has not been detected. It would seem, therefore, that carbon is produced by the disintegration of heavier atoms belonging to the same periodic system, under the influence of the radium emanation.

A valuable means of detecting the nature of radio-active substances has lately been discovered in isomorphism. When carous salts are crystallized from solutions containing radio-active substances, only those salts which are isomorphous with the radio-active substances exhibited any radio-activity. Potash, magnesium, and lanthanum salts, crystallized from solutions containing actinium X, are wholly inactive, but barium and lead salts crystallized from solutions containing actinium X were found strongly active. The experimenters infer that actinium X belongs to the group of metals of the alkaline earths. Thorium X behaves in the same way as actinium X. Such investigations have opened the way for a definite classification of the radio-active elements.

It has recently been suggested that the benefit to be derived from mud baths consisted in the radio-activity of the earth in which the patient's body is immersed. The benefits to be derived from spring water in the various hydropathic resorts are now thought to be due, also, to the radio-activity of the water, which becomes charged in its passage beneath the ground.

Efforts have lately been made to abstract radium from the waters of the ocean,—so far, however, with but little success. It is believed that a vast supply of radium exists within the ocean; 20,000 tons, according to Prof. John Joly, of the University of Dublin. He also asserts that there must be more than a million tons of radium contained in the sediments that are deposited over the floor of the ocean. Radium has been found in meteorites, also in the sun (qv) which gives us an entirely new conception of the sun's life and the possibilities of its energy duration.

One of the greatest drawbacks to treatment by means of radium has been the exorbitant price of the metal, which prevented all but the wealthy, or public institutions, from obtaining the means to experiment, and try its effect upon their patients. But late in 1910, Doctor Churchward, of Norwood, obtained a new ore, at comparatively small cost, from which he thinks much is to be hoped. This is calcio-phosphate of uranium. It is light brown in color, marked with patches of green, where the radio-activity is most active. The first specimens came from Portugal, but it has also been found in Australia.

lia. It has been estimated that the cost would not be more than a millionth that of radium;— if only it will produce the same results. Up to the end of 1910, it had been known only about four months, which is too short a time to allow any definite conclusion being reached as regards its value; but it has received preliminary trials in ulcer, cancer and tuberculosis,— with some success, apparently, in all cases. Further research will be needed to establish its value beyond doubt.

Recent investigations in radio-activity show that greater detail and specialization are becoming necessary, even within the field of radio-activity itself. Thus, alpha particles are being studied separately, by several men, and many valuable deductions have been drawn from the observed facts. It has been concluded e. g., that alpha-particles carry a double charge; the "distance" of its ionizing power has been measured, in various substances, etc.

Speaking of these investigations, Prof. F. Henrich, says in a recent issue of the *Scientific American Supplement* (12 Nov. 1910)

"The ejection of an alpha particle from an atom diminishes the atomic weight by four units. . . . Uranium may be converted into lead by a series of such losses. The alpha particles were first counted by Rutherford and Geiger, by means of the effect produced upon an electrometer by gases ionized by these particles. In this way it was found that 4×10^{10} alpha particles are emitted by 1 gramme of the radium in 1 second. A second method is based on the fact that each alpha particle, on striking a screen covered with crystallized zinc sulphide, produces a flash of light. The phenomenon is called scintillation, and was discovered by Crookes. By this method Regner has counted the alpha particles and obtained results closely accordant with Rutherford's.

"The study of alpha particles has contributed greatly to reviving the hypothesis of the material nature of atoms, which has in late years had a revival in the energetic theory. The transformation of alpha particles into atoms of helium has furnished data for the calculation of important atomic constants. Two of these are the number of molecules in a cubic centimeter of gas (N) and the electrical charge of an ion (e). The results obtained by these methods are:

$$\begin{aligned} N &= 2.77 \times 10^{19} \\ e &= 4.65 \times 10^{19} \end{aligned}$$

"These values agree closely with those obtained by totally different methods and by Planck's theoretical calculations. Planck's values are:

$$\begin{aligned} N &= 2.7 \times 10^{19} \\ e &= 4.69 \times 10^{19} \end{aligned}$$

"This remarkable coincidence affords a striking proof of the correctness of the atomistic theory of electricity and matter."

The question whether radio-activity is common to all elements was first studied experimentally by Mme. Curie, who found that no element, except uranium and thorium exhibited more than one per cent of the activity of uranium. Campbell subsequently, by a very sensitive method, obtained results indicating the existence of the other radio-active elements, especially potassium, rubidium and lead. Elster and Geitel, however, showed that the apparent

radio-activity of lead is due to the presence of impurities, containing radium F.

Levin and Ruer have recently made a comprehensive study of all groups of elements by a photographic method, which has the advantage of being very sensitive, because cumulative action can be employed. The photographic plates were wrapped in black paper, and on their sensitive sides perforated sheets of brass were laid. The substances under investigation, wrapped in paper, were placed in the perforations. The exposure was continued six months. The paper wrappings prevented the detention of alpha-rays by this method.

Progress has been made in the study of radium emanation, which is one of the most important radio-active substances. Rutherford, and also Ramsay and Gray, have condensed the emanation into the liquid and solid forms. Liquid emanation is colorless, but emits a faint bluish green phosphorescence. By spraying with liquid air a tube which is filled with the emanation, and covered with cotton wool, a solid sheet of steel-blue metallic sheen is obtained. When the cooling is carried further, the color changes successively to white, yellow and orange, and, when the solid emanation is allowed to become warmer, these colors appear in the reverse order. "The boiling point of the emanation is 80° F., according to Ramsay and Gray, and 85° F., according to Rutherford. Its melting point is 96° F.; its critical temperature is 22° F., its critical pressure is 1.87 inches of mercury. Its atomic weight should be 222, according to the disintegration theory; but the experiments of Ramsay and Gray give the value, 176."

During 1910 researches of Sir William Ramsay and Doctor Gray made it appear extremely probable that the so-called "emanation of radium" is an element which ranks among inert gases at Lake Argon and is a constituent of the air that we breathe. The two scientists therefore propose to rename the emanation, in the future, calling it by the more scientific and less cumbersome term of "niton."

During the year 1910, 1.92 grammes of radium were sold by the radium bank of Paris,—realizing \$153,600. This was all produced at the Nogent-sur-Marne factories. About a hundred thousand dollars worth of the metal was also sold to foreign countries during the year. About \$135,000 worth of the metal was used for medicinal purposes; and some \$15,000 worth for industrial purposes.

Railroad Car Sleepers. Sleeping cars, of improved and novel construction, have been recently designed for use on trolley lines and adaptable to ordinary use. The new cars are used on the interurban electric railway between Peoria, Illinois and St. Louis, Mo., as sleeping cars for a night's trip, but are not suitable for ordinary day travel. Some of the innovations, however, could be used in the construction of standard Pullman sleepers.

The berths, instead of being made by the adjustment of seats, are already made and folded against the wall, leaving a free space for a folding chair. On preparing for the night, it is possible to leave the bed up, thus allowing the traveller to undress in comfort. If the upper berth is not sold, the rules of the company are to leave it open, while the rule on all other sleeping cars is to leave the upper berth

RAILROAD CASUALTIES — RAILROAD CONSTRUCTION

down whether it is sold or not, making it frequently necessary for travellers to purchase both upper and lower berths in order to secure comfort.

The berths are also 6 inches longer than those in ordinary cars and in the wall at each berth is a small safe in which passengers can place their valuables, turning the key on them. This valuable addition to the cars has met with favorable comment. In the wall at the head of the bed is a light, supplied with electricity by a storage battery, giving a steadier light than if it were operated by the trolley.

The upper berth has two notable advantages. It has a window through which fresh air can be admitted and the curtains extend to the ceiling, shutting out the chandelier lights. On returning from the lavatory, the passenger finds his berth shut away, and in the space a small table on which coffee and rolls are placed as part of the night's entertainment. This road has also forbidden the tipping of porters, posting notices that they are amply paid.

Compartment cars are coming into more common use in this country. A number of railroads have installed them. They are built with a passageway down one side of the car, the various compartments opening off the passageway. A further improvement on this plan has been made by the New York, New Haven and Hartford Railroad, which has introduced brass beds into its compartments and has a small bathroom in a separate room attached to each compartment. A complete bureau, two chairs, and a drop table are in the compartment besides the bed. There are only seven compartments to a car, fitted with costly woods such as Cuban mahogany, koko, English oak, and vermillion. A new ventilation system has been installed in the cars.

Ventilation in sleeping cars engaged the attention of leading health authorities and a discussion on the subject took place at the meeting of the American Health Association in Milwaukee, Oct. 1910. There it was pointed out that ventilation was due to poor control of the heat supply. This matter, however, has been remedied on many railroads. On the new all-steel cars on the Pennsylvania Railroad the windows are kept hermetically closed and there is no apparent means for the ingress of fresh air, but the air is constantly fresh because it is taken in over heated coils and allowed to pass out through ventilators in the ceiling. The arrangement has been made to allow 50,000 square feet of fresh air to each passenger when every seat is occupied. The conductor regulates the amount of heat.

Recently 2,000 samples of air from sleeping cars were examined, and showed that an average of 40,000 cubic feet of air was supplied sleepers in modern cars equipped with the new ventilating device in use by the Pullman Company. In some cars the average was as low as 12,000 cubic feet per hour.

Railroad Casualties. The official figures issued by the Interstate Commerce Commission for the year ending 30 June 1910 report 3,804 passengers killed and 82,374 injured on the American railroads. This was an increase of 1,013 killed and 18,454 injured over the previous year. There were 5,861 collisions, killing 433 and injuring 7,765. The damage to railroad property through collision was \$4,629,279. There were 5,910 derailments, in which 34 persons were

killed and 4,814 injured. The total killed and injured for April, May and June 1910 was 20,650. Laws passed calling for more rigid inspection of boilers resulted in a decrease in boiler explosions.

Railroad Commuting Business. During the summer of 1910 the railroads handling the large commuting business in and out of New York City increased the rates. The reason given for so doing was increase in wages, fuel, taxes and equipment. In a hearing before John M. Harlan, member of the Interstate Commerce Commission, officers of the Pennsylvania Railroad declared that commuters were objects of charity from the railroad, and that they cost more to transport than was made from them. The figures given by John G. Rogers, assistant general traffic manager, showed that the average commuter is carried 14 miles at a cost fixed at 913 cents in train expenses, 686 cents terminal expenses, and 228 cents ferry fare. Until the rates were raised the commuter was paying 11 cents, or 7 cents less than this cost. The rate was raised to only 13. Of the items which made up this expense Rogers said that 55 per cent was in train crews, fuel, oil and stations in commuting zones; 23 per cent was a fair dividing point between what was chargeable to commuters and that chargeable to through passengers and freight. The remaining 22 per cent he laid to fixed charges, maintenance, road bed and terminals. The cost of operating commuting trains per passenger he placed at 1.29 cents per mile. From the through service he said the average gross revenue was 223 cents per mile for through passengers, but was only 133 from the commuting area.

For commuters on the Pennsylvania Railroad who wished to avail themselves of the new Pennsylvania station in New York City an extra charge was made. This was \$5 flat raise on 50 family and firm commutation tickets and \$6 increase on 60 trip monthly commutation tickets. This cost was made to meet greater expenses of operating the new station and the extra cost of bringing trains through the tubes under the Hudson River.

It was held at one of the sessions before the Interstate Commerce Commission that commuters should be allowed a rebate on commutation tickets not entirely used. It was shown that the 60-trip tickets are rarely used and that the average commuter has unused at the end of the month from 10 to 15 tickets.

The commuters, however, were not in such a good position to fight as the shippers in the freight rate cases, as they were unorganized. Moreover, public sentiment as to the justice of the raise in rates was not at all unanimous.

Railroad Construction. The opening of the Western Pacific from Salt Lake to San Francisco completed the last link in a new transcontinental railroad. With the Denver & Rio Grande and Missouri Pacific this opens the California field to new interests. It is the seventh transcontinental line in this country, the completion of the Chicago, Milwaukee & St. Paul road two years earlier making the sixth. In Canada the Grand Trunk Pacific is building rapidly to Prince Rupert, forming the most northerly transcontinental road. The Western Pacific cost \$86,000,000 to build. It has a one per cent grade across the Sierra Nevada, crossing the mountain barrier through

RAILROAD RATES

Beckwith Pass and following the course of the Feather River. This was one of the teaming routes before railroads were built, supplies for Nevada crossing the mountains from Sacramento by this route. Trains were running in September 1910. The grade of the Southern Pacific over the mountains is 116 feet to the mile.

The Western Pacific is regarded as a powerful rival to the Harriman system, furnishing a direct route east and connecting with the Burlington and Rock Island systems as soon as it crosses the Rocky Mountains.

To compete with the Western Pacific the Southern Pacific built a second line over the mountains with a grade of 80 feet to the mile to be used for east-bound trains. It also completed the cut-off across the southern arm of San Francisco bay, making it possible to bring eastern and northern freight directly into San Francisco via the Vistacion valley, instead of ferrying it in.

More new main lines were constructed in the United States in the year 1910 than in 1909 or 1908. The longest stretch was built in New Mexico and Texas by the Santa Fe. This was 160 miles. The St. Paul built 421 miles in short stretches in four States. All the other new mileage was made up of small extensions and connecting links. The new mileage was, however, lower than the average for the preceding 15 years. The greatest amount of new mileage was in 1902, when 6,026 was constructed.

In new freight and passenger cars the orders for the railroad companies fell behind, chiefly on account of the uncertainty arising out of the rate regulations. But the orders for locomotives were greater than in any year since 1896. The orders for locomotives were 3,787; passenger cars, 3,831; and freight cars, 141,204. There was a surplus of cars during 1910, due to some extent to the large orders placed in 1905 and 1906 which were years of car shortages. The smallest orders were given in 1908 when only 62,669 were ordered.

The largest untouched field for railroad development, the interior of Oregon, was opened during the year by both the Harriman and Hill interests, south from the Columbia River. It is the intention to strike into the same country also from the eastern boundary, breaking up the only remaining district of large size where open range remained.

Railroad Rates, Regulation of. The attack on American railroads incident to a general raising of freight rates overshadowed all else in the railroad world, in 1910, and brought out a fundamental discussion of railroad problems. This promised not only to settle one of the chief economic questions of the day but to bring out faulty conditions in railroad management which would lead to a change for the better.

Reduced to simplest terms, the railroads maintained that it was necessary for them to increase rates in order to pay expenses, meet the increasing price of labor, and carry on the regular work of steady improvement. The shippers who fought the increase, with the exception of a limited number of shipping interests, maintained that many of the railroad expenses were unnecessary and that scientific management of the railroads would bring about a saving that would enable them to pay higher dividends and make all improvements without

increasing the rates. They argued that all other forms of business, on account of competition, had been forced to adopt every conceivable device to reduce cost of production and handling, but that the railroads, by rate agreements and lack of competition, had not been subject to this healthful stimulus and had not advanced at the same rate as the rest of the business world. Instead of raising rates, the shippers maintained that the railroads should have been able to reduce rates.

Having made several changes in freight rates without interference, the members of the Western Traffic Association, which comprises most of the railroads west of the Mississippi River planned to make an increase on 1 June 1910, but on 31 May, two representatives of the Attorney General appeared before Judge D. P. Dyer in the United States Court at Hannibal, Mo., and secured injunctions restraining the railroads from putting this new schedule into effect. The new freight rates would have made an increase of from 3 to 31 per cent. This extraordinary proceeding on the part of the Attorney General followed a conference with President Taft, brought about by a complaint issued by the Omaha Business Men's Committee.

Thus enjoined and with hearings going on before the Interstate Commerce Commission into the earnings of the railroads and their physical valuations the whole subject became the chief economic problem of the day and remained unsettled at the beginning of 1911. At that time an outcome could not be predicted.

The general facts regarding the railroads are that they represent a capitalization of \$13,600,000,000, or a trifle less than \$58,000 per mile of road, and less than \$40,000 per mile of track. In comparison the farm products are worth an average of \$20,000,000,000 and manufacturing \$13,000,000,000. The number of stockholders interested is 440,000 and the number of stock and bond holders combined is about 1,000,000.

Complete statistics on the earnings of the railroads for 1906, 1907 and 1908 have been furnished by the Interstate Commerce Commission. These show:

	1906	1907	1908
Total earnings	\$2,325,765,167	\$2,589,105,578	\$2,394,780,410
Expenses and taxes	1,611,662,886	1,828,828,189	1,754,951,949
Net earnings	\$714,102,281	\$760,277,389	\$639,828,461

On an average valuation of \$13,000,000 this is a return of 5.49 per cent in 1906; 5.85 per cent for 1907; 4.92 per cent for 1908. The following table shows clearly the disposition of the money earned by the railroads, taking \$100 as a basis:

Labor—direct payment	\$43.36
Labor in materials purchased	7.77
Labor in fuel and oil	6.88
Total for labor	\$58.01
Fuel and oil—less labor	1.72
Material—less labor	3.33
Hire of equipment and buildings	2.46
Hire of tracks and terminals	4.60
Damages and injuries	1.80
Taxes	3.56
Interest	13.34
Dividends	2.39
Total	91.21
Betterments to property, etc.	4.37
Dividends	4.42
	\$100.00

RAILROAD RATES—RAILROAD TERMINALS

The railroads have also been able to show a diminishing earning capacity, due to the increasing cost of labor and material. Considered merely on the showing of the railroad men there was every reason for permitting an increase in rates. In fact, many of the largest shippers expressed their willingness to see reasonable advances, so that railroad investments would continue to be desirable to capitalists, returning at last 6 per cent on the money invested. A little over 4 per cent was the prevailing dividends at this time. But the Administration, headed by President Taft and under the immediate leadership of Attorney General Wickersham, saw that a permanent solution was necessary. President Taft late in 1910 appointed a special commission to study the control of the capitalization of railroads, and various organizations of shippers were trying to prove undue waste and that railroads need do nothing but reorganize their system to secure a reduction of from one to three or four per cent in running expenses, which would permit a profit without raising rates. The three great branches of investigation, planned for the future, are capitalization, systematic reduction in operation and systematic reduction in cost of business methods.

The most striking statement made in behalf of the shippers was that of Louis D. Brandeis, of Boston, representing a traffic committee of Eastern shippers, who told the Interstate Commerce Commission, 21 Nov. 1910, that the railroads could save \$1,000,000 a day by scientific management. This was brought out at the hearing at which the railroads were attempting to secure the consent of the Commission to permit the increase in rates prevented by the government injunction. Mr Brandeis introduced a number of witnesses to show the enormous savings to be made by using shorter and better methods in both operating and office work. The sum total of these, on account of the extra expense leakages, Brandeis placed at \$365,000,000 a year.

This point placed the emphasis of the freight on the cost of railroading and placed the burden of proof upon the railroads to show why they are entitled to make so large an increase in rates.

Meanwhile there had been other controversies over freight rates. The long and the short haul discussion was settled in such a manner as to permit the railroads to charge a lower price for a longer haul in case it met water competition in the longer haul. The Rocky Mountain cities were chiefly affected by this ruling, the rates frequently being so much higher than to the Pacific Coast that it was possible to ship the whole distance and back into the interior again for no higher a rate than for the shorter haul. And just before the adjournment of the Supreme Court of the United States in the spring of 1910, decisions were handed down upholding the validity of the orders of the Interstate Commerce Commission reducing class rates between the Mississippi and Missouri rivers on shipments from the Atlantic seaboard to Missouri river cities, and also on shipments from Chicago and St. Louis to Denver. The orders were attacked as an illegal attempt of the Commission to create zones of traffic, but the Supreme Court could see no such attempt.

The Minnesota 2-cent rate case was won by the railroads, Charles E. Otis, special master in

chancery who heard the commodity freight and 2-cent passenger rate cases, reporting to the United States Circuit Court that the rates were unconstitutional and confiscatory.

The general public interest in railroad management and regulation resulted in a great deal of testimony being produced at various hearings of the Interstate Commerce Commission. Facts brought out indicated that maintenance had increased greatly. Witnesses were produced to show that the railroads were over-capitalized. At the hearing of 30 Nov. 1910, before the Interstate Commerce Commission at Washington, figures were produced to show that of the 135 railroad properties in the states of Minnesota, South Dakota, Wisconsin, and Texas, the railroads were overvalued by \$400,000,000. Their total valuation according to the books of the companies was \$1,243,773,794, or one-twelfth of the total capitalization of all the railroads. The total value of the railroad properties by appraisal was \$845,644,658.

The charge was made against the proposed increase in rates that they would be discriminatory, applying to only 10.2 per cent of tonnage in the territory covered.

Complaint was made by railroad officials that the increase in freight meant to them an increase in the cost which was gradually eating up all profit and at present freight rates was certain to lead to bankruptcy. In answer, the shippers pointed out that if there was an increase of cost to each increase in business, there was something wrong with the management of the railroads, as more business should lead to larger net revenue.

Railroad Terminals, New. The two most notable examples of modern railroad terminals are the Pennsylvania Station and the Grand Central Station in New York City. The Pennsylvania Station has been completed, but the Grand Central Station has required so much extra labor in order not to interfere with the traffic that it has taken five years to rearrange the tracks into tiers and lay the foundations for the new building.

The Pennsylvania.—The Pennsylvania's entrance to New York consists of two tubes under the North River, four tubes under the East River, and a station and train yard formerly occupied by 500 buildings. All that portion of the Pennsylvania system which belongs to the new terminal begins at Harrison, N. J., a short distance east of Newark, where a large transfer station has been built. From that point a new double track on an elevated roadway crosses the Hackensack Meadows, passes under Bergen Hill in a tunnel and without rising again to the surface, plunges into two disconnected tubes. Coming up on Manhattan Island at the foot of West 33rd street, the tracks multiply from 2 to 21 for the terminal. The station faces 7th avenue, between 31st and 33d streets, the tracks to Long Island passing out under it eastward in twin tunnels under 32d and 33d streets, gradually dropping as they approach the East River, until they enter the four single track tubes under the East River. On the Long Island side they come to the surface at Sunnyside, connecting there with the Long Island Railroad.

The terminal required 28 acres of land in the heart of New York City. It meant the purchasing of four large city blocks and the demolish-

ing of the buildings. To effect this it was necessary to attack the piles of buildings as though they were hills to be cut away. They were tunneled from end to end and removed in huge chunks. Once the buildings were gone the whole area was excavated to a depth varying from 45 to 60 feet. To lay the foundations for the tracks and the buildings cost \$5,000,000. The building itself cost \$15,000,000. It has a frontage on both 7th and 8th avenues of 430 feet, and the side walls are 784 feet long.

The structure was built with the purpose of handling the crowds expeditiously, a problem which had not previously been solved in any railroad terminal. It was anticipated that the building within its lifetime would handle as high as 750,000 to 1,000,000 people a day, and it has been arranged to do this without crowding. The whole purpose was to provide ample passageway and free ingress to trains without any chance of delay from crowds coming in an opposite direction. To do this the entrances and exits are kept separate and even when the passageways are full, since the crowds are moving in one direction, no inconvenience arises.

Since no steam locomotives ever enter the station it has been possible to enclose the whole with a lofty glass roof, under which trains draw up at their allotted numbers. Most of the traffic is suburban and the commuters know at which track to find their train. Travellers taking main-line or express trains cannot go astray, since every turn leads to the same great platform where all difficulty is immediately solved.

On leaving trains the crowds pass out under this general esplanade, and do not come in contact with the outgoing passengers. At any point of the building approached there is an entrance and a corresponding exit. In planning the building the attempt was to provide as many lines of circulation as possible. The station is in this respect a great bridge over the tracks, with entrances on all the main axes.

The trackage within the station is 16 miles, and the entire length of platforms adjacent trains totals 21,500 feet. The 7th avenue entrance, which is for foot passengers only, leads to the main waiting room through an arcade 225 feet long by 45 feet wide, flanked on both sides by shops and booths. Restaurant, lunchroom, and cafe are located at the far end of the arcade close to the general waiting room and concourse. The main baggage room is on the same level with the general waiting room, and has a frontage of 430 feet. The baggage itself is delivered to the trains and removed through special subways on motor trucks. The main underground passageway for incoming passengers passes under this whole area. It is 60 feet wide and splits into separate exits to all streets.

For convenience the tracks are divided. Those on the northern side of the station are for Long Island trains and have separate entrances and exits, so that the Long Island traffic can be handled independently of the rest. On the south side are suburban trains terminating in New Jersey and the main line trains for the South and West.

The New York Central.—The new Grand Central Station will be entered from different levels, and the trains, hauled by electric locomotives, will arrive and depart from the station on

three levels. All the familiar appearance of a railroad terminal will be done away with, and, although passengers on the different levels will pass through the same general concourse, those on other levels will not mingle with them. The suburban traffic and the main-line traffic will use different entrances and exits and be entirely separate from each other. The building will be so free from the usual noises incident to railroad yards that an office building will be constructed over the main station on Forty-second street, and the present terminal yards will be criss-crossed by streets and eventually built over with apartment houses. It will affect the appearance of the city, when completed, little more than the subway systems. The trains will be despatched from a room far removed from any of the trains, and they will be automatically sent in and out of the tunnels with the assistance of large illuminated maps, one for each track level. These maps will hang in the office of the chief train despatcher, and as the trains pass from one portion of the track to another will record their progress, so that the despatcher will be able to know the exact position of all trains within the terminal at a glance and order their progress through the narrow trackage up Park Avenue.

Innovations in the new terminal are for easy handling of passengers and greater comfort for the travelling public. Instead of personally picking out a trunk among hundreds in the baggage room, travellers will send their trunk checks with their tickets through a pneumatic tube to the baggage room, and, as soon as the baggage is checked the ticket and the forwarding checks are returned. On alighting from the trains the effort will be to produce the effect of stepping into the corridor of a hotel. Small dressing rooms will also be provided for the accommodation of passengers.

The new building will be 600 feet long, 300 feet wide, and 105 feet high. At the street level it will be 745 feet long, 480 feet wide and 45 feet high. Since 4th avenue slopes gradually on approaching 42d street, a raised causeway will be constructed permitting carriages to approach the upper trackage level. The roadway will also be continued around the building on both sides. In spite of the fact that there will appear to be much less space occupied by the terminal yard the capacity will 1,149 cars, while the capacity of the old terminal was only 366.

Of the 42 tracks on the upper level, which will be reserved for express trains, 29 will be adjacent to platforms and 5 will be connected by a series of loops with yard tracks on the east side of the yard. Inbound trains will be unloaded on these tracks, and the cars will be withdrawn to the storage yard without interference from out-going trains. Inbound suburban trains will approach on the west side of the yard, and the passengers will leave the terminal on the opposite side from the through passengers, avoiding congestion in the street. As these trains will for the most part leave immediately they will be moved to a track adjacent to the platform. There will be 72 tracks in the terminal, aggregating 32 miles.

Railroads, Electrification of. Recent examples indicate that ultimately all railroad lines will be electrified on the divisions approaching larger cities and on stretches of track where there are an unusual number of tunnels.

RAILROADS — RAILWAY

The most noteworthy example of electrification has been ordered by the Boston and Maine Railroad for the Hoosac Tunnel, in Western Massachusetts. The tunnel was for many years the longest in this country, and, having been built early in the railroad era, is badly ventilated, making it necessary for trains to pass through it with closed windows in a suffocating atmosphere. This has resulted in a loss of traffic, which has long been recognized by the officials of the road.

The first surveys were made to determine whether to use a third rail or an overhead trolley. The overhead trolley was decided upon, and a contract has been let by the railroad with the Westinghouse Electric and Manufacturing Company for equipping the tunnel and the installation of a trolley. The electrified portion will extend from Williamstown eastward to the eastern end of the tunnel. The contract price is \$1,000,000.

As a result of the new contract, the Boston and Maine officials anticipate an increase in the passenger traffic over the road amounting to \$100,000 a year. Meanwhile, during the construction of the plant and the installation of the trolley system, oil-burning locomotives have been substituted for coal-burning locomotives.

The New York Central Railroad, having equipped its lines with electric locomotives as far as Yonkers three years ago, is now equipping the system as far as Albany, so that electric trains will operate out of New York for that distance. To carry out the work the directors have ordered an additional issue of \$150,000,000 stock.

The Pennsylvania Railroad, which controls the Long Island Railroad, has electrified part of the system and plans to electrify all of it. Its trains under the East and North rivers at New York are also operated by special double-power electric locomotives, built expressly for the purpose. Plans to electrify all its trains running between New York and Philadelphia have also been considered by the board of directors. Recently they made a contract for the electrification of the important Philadelphia-Atlantic City line.

The New York, New Haven and Hartford Railroad, which operates its trains out of the Grand Central Station in New York, has ordered 30 electric locomotives to be used on its trains as far as Stamford, Conn. A power house for the generation of electricity is being built, and the whole equipment installed. There has also been serious discussion of the advisability of electrifying the main line from New York to Boston.

The tunnel under the St. Clair River, between Detroit and Windsor, on the Grand Trunk line, is now being electrified, a contract having been let for that purpose.

The Illinois Central, the Erie, almost every large railroad which touches at or terminates in large cities, is making similar plans, and railroad men confidently predict that electrification is scarcely begun. At the present time there are changes under way from steam to electricity costing \$500,000,000.

Predictions of the passing of steam have been made, however, ever since the first electric car was successfully tested at Richmond, Va., in 1883. At that time it was freely predicted that electricity would take the place of steam in 20 years. But while the growth of electric lines,

both urban and interurban, has been far greater than anticipated, railroads have held their own against them except in suburban traffic, and have only been superseded there by electrification of existing lines.

George Westinghouse, the most competent authority on the subject, has taken occasion to point out the necessity for railroads and manufacturers of railroad equipment to adopt standard types and provide for a voltage which will make possible the interchange of cars and locomotives. Recalling the situation which developed in the early railroad era by a diversity of gauges, when the cars of one line were prevented from further progress because of their wheels not fitting the track, he regards as imperative an adoption by all railroad lines of the following fundamental requirements: standard gauge of track, standard or interchangeable type of coupling for vehicles, uniform interchangeable type of brake apparatus, interchangeable heating apparatus, and uniform system of train signals. From the purely electric side he also names the following as requirements: supply of electricity of uniform quality as to voltage and periodicity, conductors to convey this electricity so uniformly located with reference to the rails that, without change of any kind, an electrically-fitted motor or car of any company can collect its supply of current when upon the lines of other companies; uniform apparatus for control of electric supply whereby two or more electrically fitted locomotives or cars from different lines can be operated together from one locomotive or car.

Mr. Westinghouse is best fitted to speak on railroad electrification, since he developed and made commercially possible the generation of alternating currents. He built two 10 h p single-phase motors, which were the first ones constructed suitable for locomotives. At that time, however, no use was made of them in that direction, since there was no demand for electric locomotives. Many electrical experts have been working on the problem since that time, and there are three systems now in use. The "third rail" system uses a direct current, but employs an alternating current to transmit power over long distances. The single trolley system operates a single-phase, alternating-current, high-tension system, and the double trolley is used for a three-phase, alternating-current system.

The three-phase system is now being constructed in Switzerland and Italy. In Italy the Givoli line, which has a heavy grade, is being built, and 35 locomotives have been equipped for the service.

A recent use of the single trolley system for train electrification is shown in the New York, New Haven and Hartford alterations, in which it is possible to make use both of 11,000 volts, carried in a trolley over head, and the 650-volt current from the third-rail system of the New York Central Railroad. Since the New York, New Haven and Hartford has now let the contract for the Hoosac tunnel for a similar system, it is apparent that it has been adopted by this important railroad, and the single-phase system has attained to at least the importance of the third-rail. Future development, if Mr. Westinghouse's suggestion is to be followed, must be along one or the other of these systems.

Railway, Fast Trains.—The opening of the Pennsylvania Station in New York City brought

RAILWAYS

a change in the running time of the rival line to Philadelphia, the Central Railroad of New Jersey reducing the running time for 90 miles to 1 hour and 50 minutes. Allowing for the slow-downs and stops necessary this is an average running speed of 64.2 miles, the fastest scheduled time on any railroad line.

Record-breaking runs of much greater speed have been recorded, but the fastest run between New York and Chicago, made over the New York Central, in March 1909, was only at the rate of 62.5. For short distances, however, much higher speed has been attained. The notable record runs are: 1 mile on New York Central tracks, made by the Empire State Express in May 1893, 112.5 miles an hour; from Landover to Anacostia, on the Pennsylvania, Aug. 1905, 5.1 miles at the rate of 102 miles an hour; 2.4 miles on Burlington Route at 108 miles an hour, Jan. 1909; 5 miles on Plant System in Florida, March 1901, at 120 miles an hour, 7.29 miles on New York Central at 109.35 miles an hour; 3.73 miles on Michigan Central at 111.9 an hour; 4.8 miles on Reading at 115.20 miles an hour.

The record for a run of considerable distance was made on the Michigan Central, 29 Sept. 1910, when 112 miles was covered in 92 minutes. The English express trains run on the average faster than the American. On all the big English railroads there are trains scheduled for an average speed of from 55 to 61.7 miles an hour.

Railways, Hanging. A system of overhead tracks from which trains are suspended from one or more rails. The system has been experimented with for a number of years, and the most successful, both structurally and financially, is used for interurban service between two German manufacturing cities. It is the exact opposite of the new monorail systems, balanced by use of the gyroscope. Only ordinary power is required and the cars rely on gravity to keep their position. Hanging railways commend themselves to crowded districts, as they require less street space than elevated railways and do not depreciate the value of the property by casting a continuous shadow over the street.

Hanging railways originated with a design by which the cars straddled a rail above the centre of gravity. In its improved forms a number of guide rails were required, the best known, the Behr model, using five. But later developments have shown the advantage of suspending the cars entirely from the rail, allowing them to swing freely below. It has adapted itself more particularly to steep gradient railways, and makes sharp curves possible.

All suspended railways have a number of advantages not shared by other railways. Principal of these is the ease with which the cars swing at the right angle rounding curves. Their weight and the centrifugal force keep them at an angle which is conducive to speed and prevents the jar and sway common to ordinary railways. Trains can be taken around sharp curves at full speed, the obliquity of the cars regulating itself to the speed and varying according to the radius of the curves.

In the earlier systems, however, advantage was not taken of the centrifugal force to the extent it is used, at present, and guide rails, extra wheels and many other costly and com-

plicated devices were employed to prevent the cars from swaying to their natural position. Later it was discovered that they were worse than useless and since that time the possibilities of the hanging railways have been greatly widened.

The Barmen-Elberfeld road, a short distance outside of Cologne, Germany, is the best example of a successful hanging railway in existence. In building it the engineers simply suspended cars to an upper rail, doing away with all guide rails and extra wheels. The rails are in turn supported by wide arches, barely encroaching on the sky-line, and, except during the transit of trains, the existence of the roadway is hardly noticed.

The Barmen-Elberfeld road grew out of one of the earliest experiences in hanging railways, which was built at Deutz, near Cologne, in 1893. It was provided with two rails and, on that account, the possible oscillations of the cars were very limited. The radius of the curves and the speed possible were also limited. The Deutz experiment was in miniature. The line was elliptical in shape and composed of two straight sections of 22 yards each and curves of 30 feet radius. In running the miniature trains they negotiated these curves at $7\frac{1}{2}$ miles an hour, but, when a single rail was used instead, it was possible to increase the speed to 15 miles. The later experiments were all with the monorail system. At 15 miles an hour, on the single rail the angle of the carriages reached 25 degrees. Buckets of water were placed in the cars and it was found, as anticipated, that the buckets assumed the same obliquity and not a drop of water was spilled.

Seeking to make practical use of the hanging system of railways the two towns of Barmen and Elberfeld were selected, as they offered the most convenient opportunity for profitable investment. They were originally small towns which grew until the rows of houses joined, but two centres still exist and there was need at that time for rapid transit. Surface cars were unable to meet the requirements, and yet any system installed was under the necessity of maintaining not only an express speed, but of making frequent stops. What was required was a system capable of obtaining maximum speed in a few seconds.

To meet this demand the hanging railway was built and completed in 1901. It was opened for traffic 1 March of that year and in the following 9 months carried 3,500,000 passengers. The road runs from Barmen-Ritterhausen to Elberfeld, continuing on to Vohwinkel, and for the greater part of the distance is swung over the river Wippur at a height of 28 feet. The remaining $2\frac{1}{4}$ miles is over streets. In constructing it there was no necessity of purchasing land except at the terminals. All land in that vicinity is extremely valuable and the fact that the hanging railway could take advantage of the river, which was otherwise a waste space, was an important saving.

It was not necessary in this case to take advantage of the most pronounced features of the hanging railway, hill climbing, as there were no sharp curves and the highest grade, 1 in 22.2, was far inside the possibilities of the system. The claim is not made for the hanging railway, however, that it is a mountain type. But it is able to take sudden, steep inclines with greater ease than other forms of railways.

RAILWAY SIGNALS AND SAFETY EQUIPMENT

The trains are usually of three cars each, made up on the multiple-unit plan, the conductor in the forward cab having complete control of the train. The stations are only built to accommodate 3-car trains. The cars are 40 feet long, and, according to the European custom, are divided into several compartments.

Electricity is the motive power used and the whole system is operated by a power house in Elberfeld, dealing forth a current of 600 volts. The rails are the conductors, the current returning through the girders. Three types of brake are used, hand brakes, electric brakes, and Westinghouse automatic brakes, each car carrying three cylinders of compressed air under the floor.

The usual speed is 25 miles an hour, and with the three-car trains this speed is reached in 20 seconds. There are 19 stops on the road but the trains reach maximum speed after each station so quickly that the suspended trains cover the distance in less time than the express trains on the State Railway which stop only twice and cover a trackage two-third, of a mile shorter.

As a mountain railway it has also proved itself practicable. At Loeschwitz, near Dresden, a cable railway of the suspended type is in operation, rising 264 feet in 273 yards.

Experiments have shown that the ordinary type of suspended railway, such as that used between Barmen and Elberfeld, is capable of travelling up and down a 16 per cent grade.

Railway Signals and Safety Equipment. Signalling has reached the stage of the automatic stop only after a long series of experiments. As yet it is in use in this country only in the subway systems of New York and Boston, but recent improvements make it possible for general application.

In the subway systems, as soon as a train runs upon a block, or section of the track, occupied by another train, a trip lifts up from the side of the track and is so placed as to strike the end of an air-brake coupling which hangs down at the side of the forward wheel. If the engineer does not see the signal, or is for any reason disabled, the trip strikes the loose coupling as the train speeds past, throwing it open and setting every brake in the train. As soon as the train leaves the other end of the block the trip drops and the track is clear again.

Until recently, experiments in this country with the automatic trip had not proved successful, the trip becoming clogged in bad weather. Better results have been obtained in England and on the continent of Europe, where the automatic stop and cab signalling have been developed simultaneously.

Two different forms of cab signalling have been used, the audible and the visible; and in some cases both are used for additional safety. In the Morris and Crabtree system, as the train passes a danger signal the track instrument communicates the fact through a current to the wheel, which sounds a bell in the cab. The disadvantage this system is that the machinery must be continually readjusted by the engineer.

Another form of cab signalling, invented by E. A. Bowden, depends upon a steam valve, operating on the principle of a safety valve, placed in the cab. A lever holds it closed, and

attached to the lever is a rod reaching down beside the track. At a signal point the rod is struck by a trip beside the track and the steam is allowed to escape.

The most successful of cab signals has been installed by the Great Western Railway in England. As a train passes into a block, if the track is clear, a bell rings in the cab, if there is danger ahead, a whistle blows, the whistle taking the place of the distant signal. Simultaneously with the ringing of the bell a small semaphore arm in the cab goes to clear; when the whistle blows, it moves to danger.

A ramp beside the track conveys the signals, and is operated by the same current which moves the semaphore signals. A valve on a local circuit in the engine is kept normally closed by an electromagnet, and the circuit also passes through the lower portion of the engine, where there is a switch held in position by a lever which reaches down low enough to strike the ramp as it passes. When it strikes it lifts, breaking the circuit, and, if there is danger, causes the whistle to blow and sending the miniature semaphore to danger.

When the position of the ramp indicates that the track is clear, the circuit is operated by another circuit which rings the bell, moves the semaphore to clear and prevents the whistle from blowing by an electromagnet which holds the valve down when the current is passing.

Artificial heat has proved the only successful means of keeping the ramp and trip free from ice and snow. During recent blizzards in England when the semaphore poles were frozen solid, the ramp and automatic stop, where in use, worked without trouble. So great success has been obtained both with the automatic stop and cab signalling in England that the board of trade, the most conservative railroad body in the world, has given the Great Western Railway permission to dismantle the semaphores.

The latest improvement in automatic brakes combines the advantages of all former attempts in this direction, but has not entirely done away with the danger of freezing. A powerful spring operates the trip, which would probably be sufficient for all ordinary cold weather, however, and the mechanism in itself records whether the trip is working normally. For all ordinary purposes it has overcome the difficulties, and has all but eliminated danger. The system, which is of German invention, consists of contact levers mounted on the locomotive and contacts beside the track which act as trips. As a distant signal is passed, the contact levers strike one set of track instruments, closing an electric circuit in the engine which permits the exhaust through a siren whistle. Simultaneously the engineer is warned by his cab signal and a recording device marks the fact that a distant signal has been passed. The brake cock is slowly opened and the train of its own action comes gradually to a stop.

The engineer, however, is allowed some discretion, and, if he readjusts the brakes and goes ahead, when he comes in contact with the main signal, the double contact of the contact levers with the track instruments completely opens the brake cocks and brings it to a stop immediately. The braking apparatus is now entirely out of the engineer's hands and he cannot go forward without a signal from the conductor who alone can release the brakes.

RAILWAY SIGNAL AND SAFETY EQUIPMENT — RANKIN

The advantage of this system is its complete effectiveness. No former device provided for either the recording of the signals or the locking of the brakes, removing control entirely from the hands of the engineer. The system costs no more to install than the present semaphore system, and, if the danger of freezing can be entirely obviated, will become popular among railroads, which have been trying for many years to secure an absolutely automatic device to prevent collisions and make it impossible to overrun signals.

A third rail signalling system was invented and placed in operation over a short stretch of track on the Erie Railroad during 1910. Fred Lacroix, the inventor, is a railroad man who sought to produce an automatic stop not dependent upon weather conditions. The third rail has served his purposes, and has the additional advantage that it can be used to transmit a telephone message with the towerman and obtain an explanation. All the mechanism is on the engine, where it can be brought into the roundhouse for inspection; the only portion of the track apparatus which can get out of order is the electric current, and if anything goes wrong with that it results in a tie-up of all traffic until the matter is remedied. Storage batteries and track relays are conveniently placed, and the wiring being all underground, there is no great chance of its being disabled under ordinary circumstances.

The engineer, instead of relying on semaphore signals, receives his information as to the condition of the track from a green light which shines in his cab as long as the right of way is clear. It is kept alight by an electro-magnet, which derives its magnetic powers from a shunt-wound dynamo driven by steam pressure from the engine. When it has its full energy it is sufficiently powerful to hold up a heavy iron arm, which, when in contact with the magnet, does not affect the air brake valve immediately below it and permits the train to proceed.

As long as an unbroken current passes from the third rail through the electro-magnet and back through the body of the engine to the track, the heavy arm remains up, but as soon as the current is shut off, as, for instance, by the presence of another train on the block, the magnet loses its power, the arm falls, opening the air-valve, and every brake on the train is set. The air escaping passes through a whistle, blowing in warning.

Contact with the rail is obtained by a shoe of steel brushes. As long as the third rail is in a circuit not broken by the presence of another train, the current which is local to the engine flows out through the third rail, making a complete circuit of the track wires.

The principles of the ordinary automatic block system are applied in the wiring, with ingenious use of relaying making it possible for the circuits to overlap one another continuously, permitting a train to proceed from one block to another without breaking the current. There is in fact no absolute break from one block to another and trains approaching each other in opposite directions on a single track are prevented from collision at the division point. For purposes of experiment two trains were sent down the track towards each other under full head of steam and the hands of the engineers behind their backs. As soon as each came

within the danger zone, the current failed, the brakes set and the trains were brought to a standstill within a few hundred feet, although the throttles remained wide open. Whenever a train is stopped on this system, the engineer takes down the telephone receiver, communicates with the nearest towerman and is given orders.

The continuously large death roll among freight trainmen has caused action on the part of Congress, and new regulations were issued by the Interstate Commerce Commission, 15 Oct. 1910. The order provides for the equipping of all freight cars alike. Two additional ladders are required on certain classes of cars and two additional steps are required on all cars. The Master Car Builders Association formerly attempted to secure uniform equipment but its regulations were not lived up to, as they had no binding effect on the railroads. Under the new orders, cars are to be properly equipped only as they go to the repair shop and no interference with traffic will result. Uniform safety equipment is also made imperative on both engines and cars. The railroads contend that the rule will cost \$50,000,000 in changes, but the Interstate Commerce Commission estimates the expense as only a small fraction of that amount.

Edward A. Moseley, secretary of the Commission, devoted 30 years of his life in the attempt to secure uniform railroad equipment and a stricter enforcement of employer's liability laws. On the day the agreement was finally reached he was stricken with heart disease. The successful conclusion is attributed to his efforts.

Rankin, David, American farmer: b. Indiana 1825; d. Oct. 1910. Rankin was popularly referred to as the world's greatest farmer, and to him largely belongs the credit for building up Missouri as an agricultural state. His schooling was meagre, and until his 20th year he worked as a farm hand. He then removed to Illinois. At this time land was selling for \$20 an acre in Illinois and for \$9 to \$9.50 just across the border in Missouri. This interested Mr. Rankin and he inquired the reasons. He was told that Missouri was absolutely hopeless as an agricultural State and that it was doubtful if a railroad would ever run through there. With these opinions he differed so strongly that he invested the whole of his savings in Missouri farm land. Mr. Rankin thoroughly understood farming methods and devices, and from the outset showed himself to be a wonderful farm manager. He invested his profits in the purchase of additional property which he at once put under cultivation, and had remarkable success, owing to his progressive methods. At his death he owned 24,000 acres of farm land and left a fortune of more than \$3,500,000. It was his custom to avail himself of every new farming device which would simplify or facilitate his work. Thus, he considered one of the first principles of successful farming. David Rankin built up, almost unaided, the town of Tarkio, Mo., in which he lived. He was president of the First National Bank there and also of a local electric light and power company and of a plough manufacturing company. Mr. Rankin was a Presbyterian, and the Presbyterian College of Tarkio was supported chiefly by his donations, which aggregated over \$150,000. He was the author of 'How to Succeed

in Farming' (1908), in which he has told in epigrammatic form the story of his own successful life.

Rassam, Hormuzd, Assyrian archaeologist and explorer b Mosul, Turkey, in 1826, d. London, Eng, 15 Oct. 1910. His parents were Chaldean Christians. In 1845 he became acquainted with Austen H. Layard, who was then beginning his explorations of Assyrian ruins, and in 1847 he accompanied Mr Layard to England. He held a political position at Aden, at the Indian Ocean end of the Red Sea and in 1864 he was sent by the British Government on a mission to Abyssinia, to secure the release of the British Consul and several other Europeans who were imprisoned by King Theodore. He demanded the release of the prisoners, and at first was treated with consideration, but afterwards he and two of his companions were shut up in the fortress of Magdala and were kept in chains for nearly two years, 1866-68. They suffered greatly from misery, cold and hunger, and were in constant fear of death. Great Britain sent a punitive expedition under Lord Napier, to their release, and a \$45,000,000 war with Abyssinia resulted, which ended in the suicide of the African ruler and the release of Rassam and his companions. He was connected with the British Museum, and in 1876 made repeated trips to Assyria and Babylonia, acquiring for the museum more than 100,000 pieces of terra cotta and clay-inscribed tablets recording the history of these famous old kingdoms. He discovered in Nineveh the Sardanapalus of Herodotus; found the sites of several ancient cities, among them Leppara and Cinthah; unearthed the beautiful sculptures representing the lion hunt, and the legend of the creation and the deluge, in the palace of Sardanapalus; the bronze gates of Balawat, from the time of Shalmaneser II, 858-824 B.C. His 'Narrative of the British Mission to Theodore' (2 vols 1869) is his chief publication.

Rats. It has been known for a long time that rats are largely instrumental in spreading the plague and kindred diseases. Only recently they spread the pestilence very largely in Odesa, and the Prefect of Police offered premiums for all infected rats that were killed. It is not the rats themselves that spread the disease, but the fleas which they carry (See PLAGUE). Rats have gained access to ships, and in that manner have been carried to every part of the world. The ordinary brown rat is the most destructive; it readily adapts itself to any climate and is soon at home on the new soil. They have been found from the Panama Canal to Greenland. They will eat anything and everything—not only all that man eats but many other things besides—such as carrion, mice, leather, cloth, etc. They are particularly fond of grain, corn, etc. It has been estimated that it costs about 60 cents per annum to feed each rat on corn. Of oatmeal it will consume about \$1.80 worth per annum. If, therefore, there be as many rats in the United States as there are horses, cattle, sheep, and hogs, it would cost more than \$100,000,000 a year to feed them on grain.

But the cost of this loss—the amount of damage they do, is not alone in the amount they eat. They pollute the food; besides which they dig under buildings, walls and embankments,

gnaw woodwork, cut holes in sacks, and cut up paper and other material in order to make nests.

Rats also kill young poultry and squabs. They steel eggs. They destroy the nests of wild birds. They have caused expensive leaks by gnawing through lead pipes, and have caused fires by eating off the wrapping around electric wires.

Rats multiply so rapidly that it seems almost impossible to make headway against them. The females raise very large litters of young, and the intervals between them are short. The average is more than 10, while as many as 20 rats have been found in a single nest. It has been estimated that a single pair of rats would, in three years, if unmolested, have increased to 20,000,000. Hawks, owls, weasels, minks, skunks, etc., destroy rats,—and for that reason should be encouraged. Doubtless traps and poisons will kill off great numbers of rats, but the chief means of relief for the future seems to be in the construction of rat-proof buildings; and in reducing their food-supply by a prompt disposal of all garbage and the protection of food-supplies.

In California the war with the rat has assumed gigantic proportions, and an area of some 40 square miles southwest of San Francisco is being thoroughly scoured, and great efforts made to rid the district of this pest.

Only recently, too, Dr. F. A. King, of Washington, has attempted to show that a connection exists between mice and measles, which indicates that the disease is in some manner dependent upon the presence of the creatures for its prevalence and epidemic character. Thus, according to Doctor King, mice spread the measles in much the same way as rats spread the bubonic plague. At present, the evidence for this is not conclusive; but there is enough of it to warrant further inquiry along the lines indicated.

How to Destroy Rats.—These measures may be divided into two sections, preventive and repressive. The preventive measures consist in (1) the exclusion of the animals from places where they find food and safe retreats for rearing their young. Concreting all old, wooden, and earthen floors is one effective way of preventing the ingress of rats, but, as they climb up the interior of the walls, protective measures must be taken on every floor, no matter how high the building may be. All food must be kept strictly away from rats in vessels through which they cannot gnaw. (2) The natural enemies of rats are the larger hawks and owls, skunks, foxes, coyotes, weasels, minks, dogs, cats and ferrets. All these animals should be encouraged in those localities infested by rats, in spite of the harm they themselves may do.

The principal methods of killing rats which have once found an entrance into a house are by means of traps (there are several on the market); poisons,—the chief of which are barium carbonate, strychnine, arsenic, phosphorus; and by the keeping of domestic animals, particularly cats and dogs. Tame ferrets are especially valuable, since they follow the rats into their retreats, which the larger animals cannot do. Fumigation is sometimes found useful. Carbon disulphid, chlorin, carbon monoxid, sulphur dioxid, hydrocyanic acid, etc., have all

RATS — RECALL

been employed with good results. The gases of many of these compounds are very dangerous, however, and should not be used except under the advice of an expert. Micro-organisms have been exploited in America and England for killing rats, the cost of the cultures renders them unfit for general use, however—all other considerations apart. Finally, the efforts of man have succeeded in killing many thousands of rats in badly infected districts.

From time to time we hear of plagues by mice, no less than rats, and although these are not so much to be dreaded, inasmuch as the amount of damage they do is far less, and, on the other hand, because rats are known to spread the plague itself; still, mouse plagues are occasionally very serious matters, as the recent epidemic showed. In 1907-08, an outbreak of field mice occurred in Nevada, Utah and northeast California, which caused great loss, especially in the fields of alfalfa. They quickly overran many of the fields, and their numbers increased so rapidly that they were estimated by one of the assistants of the Biological Survey to number from 8,000 to 12,000 to the acre. Fields were honey-combed with their holes, which occasionally numbered about 24,000 to the acre. During the summer they ruined one-third of the alfalfa, destroyed three-quarters of the potatoes, and badly damaged the remainder. They destroyed root crops, beets and carrots. They also girdled and killed most of the young shade-trees planted along the borders of fields.

The reasons for plagues of this character are many. The winter may be mild; food may be plentiful; mice multiply with great rapidity—resembling rats in this respect. From two to six litters of young are produced annually. The average number of young at a birth is about six, though frequently eight or ten are produced, and occasionally 12 or 13. Even the young, born early in the season, are said to breed before fall.

The mice which produce plague almost invariably belong to the *genus Microtus*, a group represented in the United States by about 50 species. The annual damage they cause to crops, nurseries, and orchards in the United States has been estimated at over \$3,000,000.

As to the measures to be taken to stamp out mice, numerous experiments have been made. The employment of bacterial diseases has been tried; but in the Humboldt Valley, where it was extensively tried by ranchmen, this method was found to fail. Poisoning is a suitable method, and doubtless disposes of thousands of rodents. Poisoned alfalfa hay, green alfalfa, crushed wheat, etc., were employed for this purpose. Ploughing up the ground by means of a brush drag was also found useful, as obliterating the holes. In this as in all other cases, however, prevention was found to be better and cheaper than cure. In summing up this question, Mr. Stanley E. Piper, said (Yearbook of the Department of Agriculture):

"Mouse plagues are usually preceded by a season or more of noticeable damage of crops, and success in checking them depends upon prompt recognition of early stages of outbreaks. When mice first attract attention by increased numbers and by damage here and there, it is high time to destroy them.

"The work carried on by the Biological Sur-

vay in Nevada, especially in Carson Valley, demonstrated that plagues can be controlled. The systematic poisoning of 10,000 acres in Humboldt Valley during the fall months, at a cost of about \$4,000, would have prevented the larger part of the damage, and, it is safe to say, would have saved at least \$175,000 worth of alfalfa.

"In ordinary times, mice should be killed by dogs, by flooding fields in cold weather, by winter poisoning, and by burning herbage which affords them shelter. Holding field mice in check is worth its cost many times over in minimizing the steady drain they inflict on farm products; moreover, it is the best preventive of widespread devastation."

Recall. This remedy adopted by the voters for the removal of officials chosen at elections has made its principal headway in the west and those cities governed by the commission form of government (qv). It was adopted by Los Angeles as far back as 1903 and other California cities followed suit. San Francisco adopted the recall at the Nov. 1907 election. By a general law passed in January 1907, all the cities of Iowa having a population of 25,000 and over have a recall. Some of the other cities adopting it are Seattle, Washington, Grand Rapids, Michigan; and Lewiston, Idaho. Under the Oregon constitution, every public officer is subject to recall by the legal voters of the State or the electoral district from which he is chosen. The petition for the recall must be filed by 25 per cent of the number of electors, but not more, who voted in his district at the preceding election for justice of the Supreme Court. The reason for the demand must be set forth in the petition. If the official does not resign within 5 days after the filing of the petition, a special election must be held within 20 days to determine whether the people will recall the officer. There is printed on the sample ballot in not more than 200 words the reasons for demanding the recall and the same amount of space is given to the officer's justification of his conduct. Other candidates may be nominated to be voted for at the special election. The candidate receiving the most votes shall be elected for the remainder of the term, whether it be the person against whom the recall petition was filed or otherwise. No recall petition can be circulated against any officer until he has actually been in office for 6 months, save and except it may be filed against a senator and representative in the legislative assembly after 5 days from the beginning of the first session after his election. After one such petition and special election, no further recall petition can be filed against the same officer during the term for which he is elected unless the petitioners shall pay into the public treasury which has paid the expenses of the special election, the entire expense of the preceding special election. The recall is not as modern as some might suppose. The first National constitution adopted in 1777 provided that the delegates of each State in Congress "shall be annually appointed in such manner as the legislature of each State shall direct . . . with a power reserved to each State to recall its delegates, or any of them, within the year and to send others in their stead for the remainder of the term. The recall, however, was done away with under The National constitution of 1787. The provision in the Oregon

RECIPROCITY AND THE TARIFF—RED CROSS

constitution and the Los Angeles charter have been generally followed in framing the recall elsewhere

Reciprocity and the Tariff. See MESSAGE, PRESIDENT'S

Reclamation. By an act of Congress of 25 June 1910, President Taft appointed a board of army engineers to report on the advisability of continuing or abandoning reclamation projects which have been undertaken by the Government in the semi-arid regions of the Western States. This board was comprised of Lieut.-Col. John Biddle, Lieut.-Col. W. C. Langfitt, Major William W. Hartz, Major C. W. Kutz, Major H. Burgess, and Brig.-Genl. William M. Marshall, retired

These projects, approved by the board, are to receive the funds obtained by the issuing of certificates of indebtedness to the extent of \$20,000,000 which is loaned to the reclamation service and to be repaid through the sale of land. The purpose of the investigation was to determine the value of the projects under way and concentrate the Government's energy upon the most important, not touching those which have been proved useless or impossible of development.

The report of the engineers was made to President Taft 25 Dec. 1910, and approved by him, insuring the issuance of the \$20,000,000 in certificates by Congress. The certificates will be issued as soon as possible and the work pushed to a rapid completion. The projects which received the engineers' recommendation and the amounts allotted them follow:

Luma, Ariz., and Cal., \$1,200,000; Salt River, Ariz., \$95,000, Grand Valley, Cal., \$1,000,000; Uncompahgre, Col., \$1,500,000; Payette, Boise, Idaho, \$2,000,000, Milk River, Mont., \$1,000,000; North Platte, Wyo. and Neb., \$2,000,000; Truckee and Carson, Nev., \$1,193,000; Rio Grande, N. M., Tex., and Mexico, \$1,500,000; Umatilla, Ore., \$325,000; Klamath, Ore. and Cal., \$600,000; Strawberry Valley, Utah, \$2,272,000; Sunnyside Valley, Yakima, Wash., \$1,250,000; Tieton, Yakima Valley, Wash., \$665,000; total, \$20,000,000.

Of the 15 projects aside from the above, several will receive no further funds from the general reclamation fund, as they are practically complete. There are: Orland, Cal.; Carlsbad, N. M.; Hondo, N. M.; Garden City, Kansas; Kittitas, Wapato; and Benton, in the Yakima projects. The following will receive allotments from the general reclamation fund: Missouri Pumping, N. D.; Belle Fourche, S. D.; Shoshone, Wyo.; Minidoka, Idaho; Huntley, Mont.; Sun River, Mont.; Lower Yellowstone, Mont.; Okanogan, Wash.

Altogether the board examined 25 projects to irrigate 3,200,000 acres at a cost of \$145,000,000. The general irrigation report amounts to \$65,700,000, and the amount expended by Jan. 1911, \$60,000,000. A total of \$28,000,000 in the next four years from the sale of public lands is expected. The board spoke highly of the men in charge of the reclamation service.

The National Irrigation Congress, held at Pueblo, Col., in Sept. 1910, endorsed the Federal control of interstate waters. This precipitated a fight in the congress, but the resolution was passed in spite of individual States.

Fruit crops in the irrigated districts of California, Oregon, and Washington have not failed since the use of irrigation. In these States prunes, dates, apples, pears, peaches, strawberries, and a variety of fruits are raised on ground which was previously barren. The same is true of Montana, Idaho, and all the semi-arid States. In the Imperial Valley in Southern California, cotton has even been grown with great success. See CONSERVATION; IRRIGATION

Red Cross, American National. This society, which has a membership of over 15,000 persons, is one of 44 Red Cross organizations of national standing, coordinated with the International Red Cross Committee, which has headquarters at Geneva, Switzerland, and which passes upon the credentials of any new National Red Cross, to determine its representative national character. The national headquarters in the United States of America are at 341 State, War, and Navy Building, Washington, D. C.

The American Red Cross (incorporated by Congress 5 Jan. 1905), is the reserve emergency organization of the American people for community relief in time of disaster and for the relief of the wounded and distressed in time of war. The Act of Congress, which incorporated the American Red Cross, in its charter, defined its purpose as follows. "To furnish volunteer aid to the sick and wounded of armies in time of war, and to carry on a system of national and international relief in time of peace, and apply the same in mitigating the sufferings caused by pestilence, famine, fire, floods, and other great national calamities, and to devise and carry on measures for preventing the same."

President William H. Taft has been head of the American branch since 1905, but Miss Mabel Boardman, who holds no office, is recognized as "the greatest dynamic force" in the organization in this country. The accounts of the Red Cross are audited by the War Department, and the chairman and five members of the control committee are representatives from the departments of State, War, Treasury, Justice, and Navy.

During the holidays, funds are raised by means of the Red Cross Stamp to fight tuberculosis. So widely used were these "Christmas stamps" that the postoffice department was forced to complain because thoughtless people believed these stamps took the place of the regular postage stamps. They are, therefore, now called Christmas seals. It was expected that in 1910 not less than \$1,000,000 would be raised through this medium to aid the work of the committee, on the prevention of tuberculosis.

The work of the American Red Cross is divided into three departments—war, national, and international relief. The war relief board has in its possession a complete list of every coastwise vessel suitable for a hospitalship, so that it can be chartered at a moment's notice. With this list there are accurate specifications and estimates of cost for equipping these ships for hospital service. The study of civil hospitals, ambulances, private automobiles, and kindred subjects is being carried on so that in time of war there will be no danger of unpreparedness in any emergency. This department organizes courses in "first aid" instruction

REDMOND — REFORMED CHURCH IN THE UNITED STATES

throughout the country, not only for war-time purposes, but for mine disasters, railroad wrecks, and similar emergencies.

The board of national relief looks after relief work following great national disasters, such as the San Francisco earthquake, the Johnstown flood, and the Galveston storm. The international relief lends a helping hand to other nations in times of affliction, such as the Mt. Pelee eruption, the Messina earthquake, and the famines of India and Russia. In recent years the Red Cross has been so sympathetic and thorough in its distribution of supplies and money in times of disorder and confusion which invariably follow catastrophes that most disbursements of relief funds are now made through its representatives.

The endowment fund committee seeks to raise \$2,000,000, the income of which will enable the society to take immediate action in time of disaster, without being forced to wait until contributions are received. At the close of 1910, \$500,000 of this fund had been subscribed. Suits are brought in the Federal courts to protect the insignia of the Red Cross from use as trade marks and for various advertising purposes.

Redmond, John Edward. Irish political leader: b. Dublin, in 1851; educated at Trinity College, Dublin. He was Barrister Gray's Inn, 1836; Irish Barrister, 1887. Since 1881 he has been in Parliament, representing New Rose, 1881-85; North Wexford, 1885-91; and Waterford since 1891. Redmond has been one of the best known organizers of the propaganda for Home Rule, and his leadership has always been not only aggressive, but able. His visits to America and Australia were productive of good results, winning sympathetic interest in, and contributions to, the cause of Home Rule. When Parnell died, in 1891, Redmond was chosen as his successor, and he so cemented all factions that in 1900 he was elected leader of the reunited Irish Nationalist Party. After the Liberals won their great triumph in the elections of 1896, his agitation for Home Rule took on increased vigor.

Reese, Frederick Focke, Fourth P. E. bishop of Georgia, and 238th in succession in the American episcopate: b. Baltimore, Md., 23 Oct. 1854. He attended the elementary schools of Baltimore and was graduated from the University of Virginia in 1875, and deciding on the ministry as his profession, he entered Berkeley Divinity School where he was graduated in 1876. He was ordered deacon in 1878, and was appointed assistant at the Church of the Ascension, Baltimore, Md. He was ordained to the priesthood, in 1879, and was rector of All Saints Church, Baltimore, until 1885, when he became rector of Trinity Church, Portsmouth, Va., 1885-90. He was rector of Christ Church, Macon, Ga., 1890-93, and of Christ Church, Nashville, Tenn., 1903-08. He was elected bishop of Wyoming in 1907, to succeed the Rt. Rev. Ethelbert Talbot, who had been translated to the diocese of Central Pennsylvania, but he declined the honor, and on 3 Feb. 1908, he was elected 4th bishop of Georgia, to succeed the Rt. Rev. Cleland Kinloch Nelson, who became bishop of Atlanta after the division of the Diocese in 1897. Bishop Reese was consecrated 20 May 1908, by Bishops Nelson,

Weed, and Gailor. The honorary degree of D.D. was conferred on him by the University of Georgia in 1900, and by the University of the South in 1908.

Reform, Civil Service. See CIVIL SERVICE REFORM.

Reformed Churches, Alliance of. An organization of upwards of 100 churches, founded in 1875 in London, England, whose membership now includes nearly 30,000,000 communicants. The churches in the United States connected with the Alliance have a membership of about 2,250,000, including the Presbyterian Church of the United States of America, the Presbyterian Church in the United States, United Presbyterian Church of North America, the Reformed (Dutch) Church in North America, the Reformed (German) Church in the United States, the Reformed Presbyterian Church Synod, the Reformed Presbyterian Church, General Synod, the Welsh Calvinistic or Presbyterian Church in the United States of America, and the Associated Reformed Synod of the South.

Reformed Church in America (Dutch). The Reformed Church in America (Dutch), bearing the name of Reformed Protestant Dutch Church in North America until 1867, was originated by settlers from Holland who established its first ecclesiastical body in 1628. The latest (1910) report of the annual synod gives the total membership as 116,815; churches, 684; ministers, 728; Sunday-schools, 776, with 117,854 scholars. The finances of the body are: congregational, \$1,569,082; benevolences, \$486,730. The church maintains flourishing mission fields in India, Japan, China, and Arabia. The Church Building Fund is maintained for the extension of the denomination in new fields of labor and to aid small and growing branches. The Disabled Ministers' Fund and the Widows' Fund are growing endowments which provide for increasing needs. Denominational institutions of learning are: New Brunswick Seminary, New Brunswick, N. J.; Western Seminary, Holland, Mich.; Arcot Theological Seminary, Palmenor, India; Rutgers College, New Brunswick, N. J.; Hope College, Holland, Mich. *The Christian Intelligencer*, New York City, and *The Leader*, Holland, Mich., are official organs of the denomination. Departmental and missionary publications are periodically issued covering every part of the church's activity. Young men are encouraged and assisted to study for the ministry, and receive support from a special educational fund.

Reformed Church in the United States (German). An evangelical Christian denomination, founded in the United States at Germantown, Pa., in 1714, by immigrants from Germany. Up to the year 1793 it was under the authority of the mother church in Holland, severing its official connection at that time. The church carries on a large mission work in the United States, Canada, Japan, and China, under home and foreign departments. Of the 189 home mission fields, 118 are under the General Board, and 71 under the two German boards known as Eastern and Western. The home mission work includes missions among the Bohemian and Hungarian immigrants, and the building of churches in pioneer fields. The

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church educational department includes: Franklin and Marshall College, Lancaster, Pa., Heidelberg College, Tiffin, Ohio, Ursinus College, Collegeville, Pa., Eastern Theological Seminary, Lancaster, Pa., Central Theological Seminary of the Reformed Church in the United States, Dayton, Ohio, and female colleges at Frederick, Ind., and Allentown, Pa. Statistics for 1909: Churches, 1,753, ministers, 1,179, members, 389,328, Sunday-schools, 1,716; teachers and officers, 25,333; scholars, 232,746; synods, 8; classes, 59.

Reformed Episcopal Church. An evangelical Christian denomination, liturgical in its worship and episcopal in its government, formed in 1873 in New York, from the membership of the Protestant Episcopal Church opposed to sacramentarianism and sacerdotalism. The church conducts both home and foreign mission work. The foreign field includes India, and the home work numbers nearly 40 mission churches among the colored people of the South. The 20th annual council was held in May 1910, when it was reported that the church organization comprised 9,419 members. The denomination has 74 churches, 82 ministers, and 8 bishops.

Reformed Presbyterian Church. The general name given to several Presbyterian bodies of like faith as the larger organizations of Presbyterians, varying in church polity, organized by Scotch Covenanters or Reformed Presbyterians. Included in these various bodies are the Synod of the Reformed Presbyterian Church of North America, with a membership of nearly 1,000; the General Synod of the Reformed Presbyterian Church in North America, which had a membership of 3,500 in 1909, with 19 churches and 19 ministers; the Reformed Presbyterian Church in the United States and Canada, with some 500 members; the Reformed Presbyterian Church, Covenanted, with a small membership. A theological seminary is maintained at Philadelphia by the General Synod. The annual meeting was held at Cincinnati, Ohio, in May 1910.

Refrigeration. Considerable progress has been made in artificial refrigeration during the past few years, both in factories, war-vessels, in the manufacture of ice, etc. A novel application of the procedure—which also has great practical importance—is the wide usage of refrigerating apparatus in war-vessels, for cooling parts of the ships containing powder, and explosive substances. It has been ascertained, for instance, that smokeless powder, if kept at too high a temperature, is likely to explode, the catastrophe on board the Battleship *Jena* being attributed to this cause. In some of the newer French battleships, therefore, such as the *Danton* and the *Voltaire*, arrangements have been made to pass a constant current of cold air through those rooms which contain the explosives used; and such a measure will doubtless be employed very largely in the future, not only in the French Navy, but by other nations as well.

The apparatus adopted by the French war-vessels is known as the Leblanc Process—from the name of the inventor—and is quite complicated in its construction. A condenser pump, placed outside of a condenser column,

is employed, and non-freezing brine cools by circulating around the room to be cooled, in pipes. An air current is made to circulate freely, being returned to the cooling chamber, from which it is again sent out, by means of a fan. The power is supplied by means of an electric motor, which can be of simple construction. It is hardly necessary to say that such a device is of great value in other connections, especially in the manufacture of such substances as gelatin and glue, in which this apparatus has proved a great help already.

At the Congrès International du Froid, held in Paris, the subject of refrigeration and artificial cold in all its forms was discussed with a fullness and breadth of learning which astonished even those who attended it. This congress was considered one of the most important that was ever held in that city; and it was attended by more than 3,000 men of science from all parts of the world. One of the most important points discussed by the congress was the possibility of obtaining cold, artificially, by means of liquid air, or oxygen, etc., and of conveying this cold from place to place,—so that it could be delivered at one's house, for example, and used as ice is used to-day. In districts where ice is not easily obtainable, this would prove a great boon; and the importance of such artificial refrigeration to medicine, biology, metallurgy, agriculture, etc., can hardly be overestimated. It was asserted by the congress that.

"The United States possesses 6,000 refrigerator cars, having a capacity of 1,200,000 tons; that the refrigerative process is applied to twelve million francs' worth of products in the same country annually, that her frigorific fleet numbers 187 ships, capable of transporting 12,000,000 sheep; that her cold storage establishments are capable of holding more than 240,000,000 kilograms (1 kilo=2.20 pounds) of meat, one milliard of eggs, and more than 250,000,000 kilograms of fruit. England imports annually nearly three milliard francs' worth of refrigerated or frozen meat. The Argentine Republic, which, in 1893, exported 1,300,000, almost centupled that in 1903. Russia's refrigerating establishments are insufficient; and a good cold-storage concern would make enormous profits."

All foods do not require the same degree of cold; as was brought out very clearly in the congress. One of the speakers asserted that: "Meats, eggs, butter, and fruits each need a different degree of temperature. Apples freeze at -0.5°C ., while raisins will sustain a temperature of -3° . Further, meat simply cooled to -2° to -4° will keep several weeks, but that frozen (-9° to -12°) will keep for two years."

The various moulds that appear some time after meat has been refrigerated, formed the subject of some discussion. Meat coming from America was said to be in a better condition, on its arrival, than that coming from Australia or the Argentine, and brought a higher price. "Thanks to the application of artificial cold, peaches and pears from California, bananas from Central America and the West Indies, apples from Canada and Australia, fish from the Baltic, and butter from Siberia, all find a ready market in the British Metropolis."

German beer, which is noted everywhere for its excellence, is most painstakingly made, and the various early stages of its manufacture are

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carried out in caves reduced nearly to the freezing point. In past years, huge blocks of ice were required to produce the degree of cold necessary; but at the present day, by the aid of refrigerating plants, this has all been changed, and there is scarcely a large manufacturing firm in the country which does not employ one or more refrigerating plants.

Artificial cold may also be employed in the manufacture of steel, of smokeless powder, of certain kinds of matches, of paraffin, linoleum, etc., and in hastening the flowering of certain plants. It seems probable that the day is not very far distant when cold will be supplied to the house,—in much the same way as gas and electricity are now supplied. At present, the cost of installation is prohibitive, but when once the process is perfected this should no longer be so, and then cold could be supplied to our houses at a nominal cost, and would simplify many household problems.

The last international congress on refrigeration was that held in Vienna, 15 Oct. 1910. There were hundreds of delegates from both hemispheres, including three from the United States. The meeting was of special significance since it coincided with Austria's first experience in the importation of frozen meats, a move to which it has been driven by the scarcity of fresh meat.

United States Ambassador Kerens, at a dinner given to a number of Austrian notabilities at Trieste, at which there were various preparations of Argentine frozen meats, told his fellow guests that there was room enough for all the meat exporters of the world and hence he would not attempt to enter into competition with his Argentine colleague. Since then Argentina and even Uruguay and Paraguay, not to mention the Australian States, have been bidding through the agency of their diplomatic representatives to supply Austria. The result is that the severe Austrian import regulations were relaxed for the first time to admit a sample consignment of 25 tons of Argentine frozen meat.

At the Vienna Congress, Mr. Vieter, of Wisconsin, and E. F. Smith, of Washington, spoke on the effect of low temperatures on micro-organisms. Among others who contributed papers on the scientific application of cold were F. O. Mathews and Van Rensselaer H. Green, of New York. It was decided to compile a trilingual technical lexicon in English, French, and German, comprising the technical terms of refrigeration in all its branches. Ambassador Kerens invited the congress to hold its next meeting in America in 1913.

A special Senate committee to investigate cold storage, headed by Senator Hepburn, was at work during Nov. and Dec. 1910, in the United States, and endorsed the suggestions made by Dr. Harvey W. Wiley, chief chemist of the Department of Agriculture, in favor of close supervision of cold storage rooms and official recognition of the length of time during which poultry, fish, meat, eggs, etc., can remain in cold storage. Nine months was recommended by Doctor Wiley. The bill reported to the Senate regulated the sale of food placed in cold storage, and required the branding of food released from cold storage in such a manner as to indicate its exact character and the length of time it has been kept on the ice. It con-

tained provisions against the sale of storage food that is unwholesome and provides penalties for misbranding. It vested in the Secretary of Agriculture the duty of enforcing the new law. The effect on the general price level of food marketed through the storages was a phase of the inquiry taken up by Senator Hepburn's committee.

Cold storage plants of the United States have a total refrigeration capacity in excess of 200,000,000 cubic feet. The extent of the application of this law is therefore very large. It indicates, also, the immense development of the cold storage industry. The various apparatus employed in the manufacture of ice and in refrigeration is receiving the attention of inventors, and a number of important features have lately been developed.

During the last year the pre-cooling method of shipping perishable freight was evolved and put into practical operation. Previous to that, for 30 years, refrigerator cars were filled with perishable freight and ice in the same manner as the refrigerator in the back porch is filled. The pre-cooling method is described by the expert, Walter V. Woehlke, as follows.

"All refrigeration has for its object the chilling and numbing of the multitudes of bacteria and fungi present in organic matter so that they cannot multiply and cause decay by their activities, and the retardation of the zymotic processes of ripening, whether the refrigerated stuff be fruits, vegetables, fresh meat, eggs, butter, or beer. To retard these processes in transit the foodstuff is placed in the car at the point of origin, the loaded car is switched to the icing platform, the bunkers at either end are filled with ice, every opening is hermetically sealed, and the car is sent off. The cold air in the ice-packed bunkers, obeying the law of gravitation, sinks to the bottom of the car, absorbs some of the heat of the lowest portion of the warm freight, rises to the top as its temperature increases until it reenters the bunkers for another circuit. Of course, air spaces have to be left in the load of freight to allow the cold air access to all parts. By this slow process of gravity circulation the perishable freight in the car is not cooled off sufficiently to prevent decay or ripening until two, three, and sometimes four days after the start, according to the temperature of the freight at the time of lading. Even when the lower two-thirds of the carload have attained the required minimum, the upper third, especially in the center of the car farthest from the bunkers, is several degrees warmer than the minimum. Because the ice in the bunkers cannot conquer this relatively high temperature in the upper part of the car, the shipment of fresh deciduous fruits, of peaches, plums, apricots, and cherries, of melons, grapes, berries, and sensitive vegetables, is restricted by the distance over which the upper portion of the freight can be carried with safety, thus preventing the development of the markets farthest distant from the producer."

A refrigerator car carrying 28,000 pounds of fruit carries 9,000 pounds of ice, or one-third of a pound of ice for every pound of freight. This, on the basis of the amount used in the domestic ice-chest, is not enough. Pre-cooling aims to equalize the odds in the refrigerator car, to do the work that cannot be

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done effectively by the 9,000 pounds of ice, to reduce the temperature of the freight to the minimum before the car starts out, leaving to the ice in the bunkers only the comparatively light task of keeping the temperature down.

As Mr. Woelke explains: "It stands to reason that a specially equipped stationary plant of large size can remove a certain number of heat units out of 14 tons of freight better, faster, and cheaper than a small plant on wheels depending for its refrigeration solely upon an insufficient quantity of ice. The ice in the car cannot reduce the temperature of the cooling medium, the air, below the freezing point, while a static air easily produce below-zero temperatures in unlimited quantities of air."

These facts are simple, but, despite their simplicity, were overlooked until Prof. G. Harold Powell, of the Bureau of Plant Industry, pointed them out after painstaking investigation. He likewise pointed out that the grower, by cooling his stuff immediately after packing, need not leave air-spaces between the packages in the car, could safely load the stuff in a solid mass, and need not ship green deciduous fruits and unripe vegetables, ripening and decay being checked at once by precooling instead of after three or four days under the old method of standard icing.

The Leblanc refrigerating machine, invented by a French engineer and constructed by the European Westinghouse Company, used the rapid evaporation of water in order to secure the cooling, where usually ammonia, methyl chloride, or carbonic acid gas are used. Water presents the advantage of giving a heat of evaporation at the high figure of 606.5 calories. "For equal weight," explains the Paris correspondent of the *Scientific American* (Supplement No. 1813), "water thus is much superior for cooling, but it has not been used in practice for practical plants, seeing that we must operate at a low temperature near the freezing point or below it. But here the vapor operator has a very low tension so that a small weight of such vapor occupies a great volume. This is not the case for the above mentioned liquified gases, seeing that their boiling point lies far below the freezing point of water. To give a low enough temperature by the use of evaporation of water we are therefore required to draw off a large volume of water vapor. M. Leblanc's device obtains this result."

Some new refrigerating liquids have been devised by W. E. Evans, an English inventor. A hermetically sealed apparatus consisting of two communicating vessels, in which a high vacuum has been produced, is used. Water containing a hygroscopic substance in solution (such as zinc chloride or caustic potash) is charged into one vessel and a small quantity is also placed in the second vessel. The first vessel is heated and the second vessel cooled, so that water distills over, and is condensed in the second vessel. The first vessel is now cooled and the second vessel surrounded by the liquid to be frozen. The water in the second vessel reevaporates and is reabsorbed rapidly by the salt in the first vessel, producing a low temperature in the second vessel. The small quantity of the salt in the second vessel prevents its contents from freezing.

Regenerationists. A new religious sect has recently been formed, to be known as "Re-

generationists," who are to live in Mexico, and live up to the doctrines of Christianity,—as taught by Christ,—and particularly live the "simple life." The strip of land upon which the Regenerationists are to live was owned by Michael Cudahy, a Chicago packer, who apparently presented it to the sect. The leader is John Belmont Judson, an Oxford graduate, who hopes, apparently, to increase the numbers of his following by force of example. The members of the sect—which is at present composed of 10 men and 12 women—will adopt the dress in vogue in the days of Noah,—as soon, that is, as they have reached their final camping ground. Mr. Judson believes that the people living in so-called civilized cities are living too fast, and are not getting the best out of life; and he and his sect will endeavor to show them how, by force of example.

Reich, Emil. English historian: b. Eperjes, Hungary, 24 March 1854, d. London, Eng., 11 Dec. 1910. He received his education in Prague, Budapest, and Vienna, and was conferred with the honorary degree *juris* universe from Vienna. He devoted himself to historical writings, and up to his thirtieth year spent his life in libraries, studying and writing from historical documents. In 1884 he concluded that such labor was unsatisfactory, and went out into the world to find a comprehension of history in realities. He thereafter traveled extensively, spent five years in America, four in France, and for about 14 years resided in England. He was employed by the British Government to assist in the preparation of the Venezuela boundary controversy. He is the author of various atlases for students of history and of many historical works, chief among which are 'History of Civilization,' 'Foundations of Modern Europe,' 'Success Among Nations,' 'The Foreigner in History,' 'Fundamental Principles of Evidence,' 'Imperialism,' 'The Failure of the Higher Criticism of the Bible,' and 'A General History of Western Nations.'

Remington, Frederic. American artist, sculptor, and author; b. Canton, N. Y., 4 Oct. 1861; d. 26 Dec. 1909. He studied at the Yale Art School and the Art Students' League, New York. He was clerk in an office a short time, but soon went West, where, as cowboy, rancher and scout, he gathered the material for the scenes of frontier life that have made him famous. Even in these earlier days he began to model in clay, with such success as to attract unusual notice. Returning East in 1889, he became a frequent contributor to the leading magazines and periodicals, depicting especially Western military and Indian life; and in 1898 went to Cuba as artist and correspondent. He was an associate member of the National Academy of Design. He executed a series of small bronzes, the best known of which are 'The Bronco Buster' and the 'Wounded Bunkie.' Some of his stories, all of them illustrated with his own drawings, are: 'Pony Tracks' (1895); 'Crooked Trails' (1898), 'Frontier Sketches' (1898); 'Men With the Bark On' (1900); 'John Ermine of the Yellowstone' (1902); 'The Way of an Indian' (1906). Latterly, without laying aside black and white, he had been interesting himself in color, and, in the opinion of many critics, achieved a proficiency with the brush equal to that of the pen, with a rich promise of even greater success. He has

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been called "the artist of a vanishing life," and is characterized "as a kind of popular historian, preserving in his work figures and scenes for whose picturesqueness he had an artist's eye, but whose essential characteristics he strove to record, above all things, with simple truth."

Republican Party. During 1910 the Republican party lost a number of important elections, resulting in a Democratic Congress and an unusual number of Democratic governors and State legislatures. The death of Congressman Lovering of Massachusetts caused a special election early in the year, which brought about a Democratic victory in a strongly Republican State. A similar situation arose in New York, where the death of Congressman Perkins resulted in a special election in Rochester, N. Y. A local Republican boss, who had fallen into popular disfavor, helped cause the defeat of his party and the election of a Democrat.

These two events took place before the primaries in June, making it evident that there would probably be other Republican losses during the year. This situation was enhanced by the split in the Republican party caused by the insurgents, but, nevertheless, a vigorous campaign was carried on through the summer and fall. A particularly animated struggle took place between the conservative and progressive branches of the Republican party in New York, ex-President Roosevelt carrying the chairmanship of the State convention against Vice-President Sherman. An unusual difficulty presented itself in this case, as President Taft had signified his consent to the choice of Sherman, but only on the condition that Roosevelt know of this purpose and withdraw. The latter part of this arrangement was not made public, however, and it appeared as if President Taft were exerting his influence against Roosevelt, which was not the case, as later developments proved.

The loss of the majority vote in Congress deprived the Republican party of a power which it had had for many years, and most of the Democrats went into office on platforms calling for radical changes in governmental policy.

In the Sixty-first Congress (1909-11) there were 219 Republicans and 172 Democrats, but in the Sixty-second (1911-13) there are 228 Democrats and 162 Republicans, showing the substantial change which has taken place in Congress. Previously the Republican party had been in control since 1890, and for the greater part of the time since 1859, when the party was organized.

Republics, American International Bureau of. See PAN-AMERICAN UNION.

Respiration Calorimeter. Throughout the whole of the past century, speculation ran rife as to the nature of the "life force," but it is only within comparatively late years that it has been possible to study this experimentally, in much the same manner that other physical and physiological forces can be studied in the laboratory. This has been rendered possible only by the aid of exact scientific instruments, and more especially the respiration calorimeter, which has recently held so prominent a place in physiological researches of this kind. There are several calorimeters, but the following, invented by Professors Atwater and Rosa, may be taken as typical.

A hermetically sealed room, called the respiration chamber, is constructed, in which the subject lives for the period of experimentation. It is heated and cooled, ventilated and lighted by artificial means, and the quantity of air, water, and food supplied to the patient are carefully noted. The food is analyzed before being allowed to enter the respiration chamber, also the water. The air is tested, both on entering and leaving the chamber; and in this manner the percentage of carbon dioxide is obtained. The feces, urine and respiratory products are carefully examined, and in this way the chemical changes of the food are seen, and at the same time the amount retained by the body is obtained. The potential energy of the retained food is then calculated, and thus the energy supplied to the body by the food and drink. The amount of energy expended by the body is next estimated, as well as possible, from the amount of muscular work performed, and, from examinations of the patient, a calculation is made of the amount of internal work, in muscular and mental operations. This last result is then added to the amount of energy expended externally; and together the result is compared with the potential energy supposedly supplied by the food and drink. The two are then found to agree more or less accurately; and in this way an equivalent of the energy is obtained, no less than the matter of the food and drink which has passed through the body.

In this way it has been possible to observe men resting and men undergoing excessive muscular strain; men fasting and on special diets. The amount of heat generated by the body can be tested; the loss of weight per diem, and various other tests can be performed, invaluable to the experimental physiologist. In fact, as before stated, it has enabled physiologists to study the body closely for lengthy periods together, and gage the energy of the body in an experimental way, instead of relying wholly upon semi-metaphysical speculations as to the nature of the "vital force," etc., which entered so largely into the physiological writing of the last century.

Reunion. French islands east of Madagascar. The area is about 956 square miles. The population in 1907 was approximately 200,000 consisting of native Africans, Chinese Coolies, Malays, Indians, Arabians and natives of Madagascar. St. Denis is the most important town, with 25,700 inhabitants. St. Pierre has a population of 32,000. Other towns are St. Paul, 20,100, and St. Louis, 12,850. The principal port is Pointe-des-Galets. There is a governor over the colony, which has belonged to France for nearly a century and a half. A privy council, and a general council of members elected, the latter sending a senator and two deputies to France as representatives, assist the chief official in the administration. The revenue and expenditure for 1909 balanced at about \$901,700, the French appropriation amounting to about \$474,000. The combined municipal debt in 1907 aggregated more than \$1,798,000. The Bank of Réunion has a reserve fund of over \$200,000, and a capital of about thrice that amount. Education is promulgated in more than 160 schools, in 1907, with 365 teachers and an enrollment of 13,500. The agricultural and stock-raising industries are successful. In 1908, 37,000 tons of sugar were ex-

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ported; 874,440 gallons of spirits; 210,000 pounds of coffee, more than 5,950,000 pounds of tapioca; and 1,40,000 pounds of vanilla and spice. The livestock in the country in 1898 consisted of 2,350 horses; 2,950 mules; 3,500 cattle; 8,350 sheep; and 5,400 goats. Articles of food are imported. The value of all the imports in 1908 was \$2,303,500, and of the exports about \$2,960,000. The annual trade with France is valued at about \$5,500,000. A State railway, 80 miles in length, connects three of the most important towns. In 1908 more than 100 vessels, of about 220,000 tons, entered and cleared at the ports of Réunion.

Rheumatism. For many years the causation of rheumatism remained unknown; recently, however, the discovery was made that this disease is due in large part at least, to the accumulation of uric acid within the system, which settles in joints, and produces the symptoms observed. Uric acid is the result, very largely, of a diet containing an excess of proteid, especially meat; and the investigations of Dr. Alexander Haig, of London, proved that when meat or an excess of proteid was abolished from the dietary, uric acid and rheumatism disappeared. This he showed by an examination of the urine, and an analysis of the secretions. The fact is now generally recognized; yet it is thought that uric acid is not the only cause of rheumatism, but merely one of its causes. An excess of proteid creates many poisons within the body, of which uric acid is but one—though doubtless a very important one—and it is this cumulated mass of poison which causes the disease and the symptoms observed. As a result of his researches Doctor Haig also proved that lemonade has the effect of reducing the amount of uric acid contained in the body. The immediate effect of the lemon acid is to increase the acidity; the 24-hour effect is, on the contrary, to decrease it. Baths, massage, and various measures have been advised from time to time in the past; but a radical change of life, and more especially of diet, is the only means by which this disease can be permanently cured.

Rhode Island. One of the North Atlantic States, with an area of 1,250 square miles, of which 200 square miles is covered with water. Rhode Island is the smallest State of the Union. Its population in 1910 was 542,610; in 1909 it was 428,556. It has five counties, 38 cities and towns. Its capital is Providence.

Agriculture.—The Census Bureau statistics for 1910 show a decrease of 6 per cent in the number of Rhode Island farms, but a general increase in expenditures for farm equipment. The total value of farm land and buildings in 1910 was \$27,456,000, as against \$23,125,000 for 1900. The value of the farm land alone increased 11 per cent. The value of farm buildings advanced 30 per cent. The total acreage in 1910 under cultivation was 442,000 acres, as compared with 456,000 in 1900. Improved acreage formed 40 per cent of the total acreage. The average value per acre in 1910 was \$62. In 1900 it was \$51. In 1909 hay was the most important crop, 68,000 tons having been raised on 62,000 acres, worth \$1,265,000. Potatoes were next in importance, 750,000 bushels being raised on 6,000 acres, worth \$600,000; 365,000 bushels of corn from 11,000 acres was worth \$354,000, and 50,000 bushels of oats from 2,000 acres, \$26,000. In 1910 there were in the State 14,000

horses, 26,000 dairy cattle, 10,000 other cattle, 9,000 sheep, 13,000 hogs. The wool cut in 1909 amounted to 34,560 pounds.

Manufactures.—Rhode Island made great progress during the decade preceding 1910 in manufactures. In 1909 there were 1,944 establishments, involving a capital of \$289,416,000. The raw materials used cost \$158,652,000; salaries and wages totalled \$18,130,000, the products bringing \$279,438,000. The average number of wage-earners employed yearly is 112,565. The leading industry is cotton spinning, 2,055,912 spindles, capitalized at \$43,527,584, producing an output worth \$30,628,843. In worsted goods manufacture, \$38,789,543 was involved, producing the most valuable output, worth \$44,477,576. Foundries, capitalized at \$23,728,205, produced a product worth \$13,959,283; the dyeing and finishing industry, closely allied with the textile manufactures, involving \$16,969,936, capital, produced goods worth \$9,981,457. Jewelry is also an important Rhode Island industry, involving \$11,999,233 capital, and producing an output worth \$14,431,756. Silverware utilizes a capitalization of \$8,552,489, and produces \$5,323,264.

The manufacture of rubber, always an important industry, has become much more important in recent years.

Mining and Fisheries.—The mineral products of Rhode Island are, in comparison with its other activities, small. Granite is the most important, the amount mined in 1908 being worth \$708,694. Graphite, talc, and lime are the other chief mineral products. Fisheries, on the other hand, have flourished more than any other industry, except manufactures. The products of the fisheries in 1908 were \$1,685,680, but fishermen from other States also taking from Rhode Island waters large quantities of fish, the annual catch is really larger. Rhode Island oystermen in 1908 harvested 1,228,000 bushels of oysters, worth \$969,490, and Connecticut oystermen in Rhode Island waters gathered 719,934 bushels, worth \$584,298. The lobster catch was 1,424,800, worth \$157,460. There are 565 independent fisheries, and 131 vessels engaged in the business.

Charities and Corrections.—There are 37 benevolent societies in Rhode Island, besides the State institutions, which include schools for the deaf and blind, homes for orphans, the old and the feeble-minded. The inmates of the State almshouse number over 500. Paupers are cared for by the towns, if they have acquired a residence of five years. Anyone bringing a pauper into a town is fined \$100.

Education.—Compulsory secondary education in Rhode Island has increased the number of high school pupils. In 1908 there were 70,962 elementary students, taught by 2,032 teachers, and 5,310 high school students, taught by 226 teachers. There is besides a State normal school, an agricultural college; and Brown University at Providence, founded in 1764, has 1,000 students. The State pays a pension to retired teachers, the highest pension at the present time being \$500. The average is \$320 a year. The Rhode Island schools open with religious exercises.

Finances.—The bonded debt of Rhode Island in 1910 was \$4,800,000. The sinking fund amounted to \$558,360. The net debt in 1909 was \$3,341,639. The real estate in 1909 was



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valued at \$390,526,885 and the personal property \$112,433,237; a total of \$511,960,122. The cash in the State treasury, 1 Jan 1908, was \$172,461. During 1909 the receipts were \$2,183,046, and the expenditures \$2,328,872, leaving a balance at the end of the year of \$26,635.

Government and Legislation—Aram J. Pothier (Republican) was reelected Governor of Rhode Island in Nov. 1910. Three amendments to the constitution were passed in 1908, one increasing the House of Representatives from 72 to 100 members, the second making the Lieutenant-Governor president of the Senate, and the third giving the Governor the veto power. In 1909 a law was passed limiting the hours of labor for women and children to 56 hours a week.

Rhodesia. Although there are Northwestern Rhodesia and Northeastern Rhodesia, lying northward from the Zambesi River in Africa, that British colony situated to the south of said river, and known as Southern Rhodesia, may be almost exclusively comprehended under the name. The territory to the north is scarcely civilized; yet it is valuable to Great Britain in many respects. The area of the colony of Rhodesia is about 144,000 square miles. The estimated population for 1909 was about 697,200; besides more than 18,000 whites. The seat of government is Salisbury, with 1,700 white inhabitants. The business town of first importance is Matabeleland, with about 3,500 white inhabitants.

Government.—The British South Africa Company is the chief power in the land. They are represented by a Resident Commissioner (and Commandant-General) in the Government. He is appointed by the Home Secretary of State; he is assisted by an Executive Council of about four members, appointed by the company. The Administrator is President of a Legislative Council of 14 members, half elected by registered electors, and the other half representatives of the company, and whose election is dependent on the approval of the Secretary of State. The revenue for 1908-09 was about \$2,755,000; the expenditure, \$2,620,000.

Justice and Public Institutions.—Justice is administered among the natives by Native Commissioners. There is a High Court, and there are Magistrates' Courts. Among the public institutions there are 15 surgeries, as well as cottage hospitals; banks, churches, hotels, schools and public libraries. At Salisbury, Bulawayo, and other towns, there are 50 fully equipped hospitals. Newspapers are published at the capital.

Railways and Telegraphs.—More than 2,000 miles of railway line have been built in Rhodesia. A line extends from Cape Town to Bulawayo; it was opened in 1897, and the total length is about 1,350 miles. A line from the capital to the town just mentioned (300 miles) is completed. From the capital to the Portuguese coast, 375 miles are in full operation. Other railroads are: Bulawayo to Victoria Falls, about 300 miles; Salisbury and the Ayrshire Mine, 85 miles; Bulawayo to West Nicholson, 120 miles; and other lines of various lengths, opening up mining regions, and greatly improving the property and prospects of the people. The Rhodesian Telegraph Sys-

tem, the African Transcontinental Telegraph Company, and private concerns had, in 1908, 4,650 miles of line, operated through 95 offices. Telegrams received and despatched in 1908 numbered 635,050. Telephone communication is very well established. Receipts from the telegraph and telephone systems in the above-mentioned year aggregated about \$150,000, and the expenditure amounted to approximately \$120,000.

Agriculture and Industry.—Land can be purchased in Rhodesia for about 50 cents an acre. Cereals, fruit-trees and vegetables grow in the country; tobacco, cotton, rubber, and grains of nearly all kinds. The mine-products are most valuable. More than 200 separate properties were producing gold in 1909; the output in ten years preceding 1909 amounted to the value of about \$70,469,250. The 1909 production amounted to the value of about \$12,790,550. Other important mineral products for the same year were silver, 991,235 ounces; copper, 316 tons; lead, 4,595 tons; coal, 757,625 tons; chrome iron, 50,650 tons; asbestos, 330 tons; and diamonds, 7,020 carats.

Commerce and Communications.—Merchandise (the chief import) coming into Rhodesia in 1908 amounted to the value of about \$7,929,000; the total value of the imports in that year was about \$8,864,550. The exportation of gold in 1908 was worth about \$11,658,800; of gold concentrates, \$565,000; and of chrome ore, \$155,000. The value of the total exports for 1908 was approximately \$12,745,650. Roads in the country are quite well looked after. There are 750 miles of cross-roads in the mining districts; total length of public highway, 3,000 miles. The means of intercourse, generally, are efficient. In 1908 there were about 75 postoffices (the northern territory of Rhodesia included). The receipts and expenditures for the year were respectively \$135,500, and \$112,100. The post-office savings-bank deposits amounted at the end of 1909 to about \$1,246,800. Mail is carried in almost every conceivable conveyance.

History, 1910.—The State of Rhodesia in South Africa succeeded, by winning a suit against the De Beers Diamond Company, in breaking the diamond monopoly of the world. The matter was still in the courts at the close of 1910, but the case had been won in the English courts and all that remained to the De Beers Company was an appeal to the Privy Council. The case was won in the trial court in February and upheld by the appeal court in July. The difficulty arose out of a loan which the British South Africa Company secured from the De Beers Company in 1892. Cecil Rhodes, who was chairman of both companies, negotiated the loan of £212,000 on terms which were disadvantageous to the development of Rhodesia. Besides 6 per cent interest, the De Beers Company received preferential right on the Rhodesian Railway which saved it £60,000 a year and was given an exclusive right to all diamonds in the British South Africa Company's territories. When diamond areas were discovered Rhodesians saw how they had been mistreated and for a number of years this was the chief topic of political dispute in Rhodesia. Finally the British South Africa Company agreed to test the validity of the contract in the English Court and the case was finally won in Feb. 1910 on a technical point.

Pending the decision of the Privy Council, the diamond miners of Rhodesia did not advance their workings, but intimations which escaped from the diamond fields were to the effect that if the decision of the courts was upheld and the diamond miners were free to compete with the De Beers Company, the diamond market would be greatly affected. It has long been an open secret that the De Beers Company regulates the production of diamonds in such a manner as to cause a steadily advancing price. This would be no longer possible with a large independent competitor in the field.

The novel idea was advocated in Rhodesia during 1910 to advance the hours of the day by one hour to secure working hours in daylight and take greater advantage of the sun. The hours of work having become fixed by custom, it was thought easier to shift the clock so that the hours of business coincided with the daylight, rather than change the hours of business.

Rhodes, James Ford. American author b. Cleveland, Ohio, 1 May 1848. He attended the University of the City of New York and the University of Chicago, but did not graduate. He engaged in literature, and devoted himself to historical research and writing. He was awarded the Loubat prize by the Berlin Academy of Sciences, and is the author of 'Historical Essays' (1909), and 'History of the United States from the Compromise of 1850', a voluminous work for which he was awarded the gold medal of the National Institute of Arts and Letters. The award was for notable achievement in history, and was held at the New Theatre, New York City, 9 Dec 1910. William Dean Howells presided and many notable literary and artistic representatives attended. John Bigelow, who had just celebrated his 93d birthday, was among the speakers.

Rice. The rice production of the year 1910 remained substantially at the figure of the previous year, which was a little more than 1,000,000 pounds of rough rice. No year previous to 1909 production exceeds the average of the five previous years by 25 per cent. The price of rice, however, declined during 1910, so that that year's crop was worth hardly \$16,000,000, which was about the value of the crops of 1906 and 1907. This value was exceeded in both 1908 and 1909, so that the value of last year's crop is about 2 per cent below the five-year average.

Rice forms the principal food of one-half the population of the earth, being more widely and generally used as a food material than any other cereal. Rice is an annual plant belonging to the natural family of the grasses. There are innumerable varieties of cultivated rice, differing in length of the season required for maturing, and in character, yield, and quantity. Their divergence not only extends to color, shape, and size of the grain, but also to the relative proportion of food constituents and the consequent flavor. South Carolina and Japan rices are rich in fats, hence are ranked high in flavor and nutrition. In Ceylon alone 161 varieties of rice are grown, while in Japan, China, and India, where its cultivation has gone on for centuries, and great care is taken in the improvement and selection, no less than 1,400

different varieties exist. The two principal varieties of lowland rice cultivated in the Atlantic States in America are the "gold seed" and the "white" rice, the original variety introduced into this country in 1694. The principal varieties planted in Louisiana are the Honduras, which are similar in appearance and character to the Carolina rice. Rice production in the United States is limited to the South Atlantic and Gulf States, where, in some sections, it is easily the principal cereal production. Lands that are low, level and easily irrigated are best adapted to the culture of this cereal, but there are varieties which can be successfully cultivated on fertile uplands without irrigation. In the interior districts of India, China, and Japan upland rice is grown to a considerable extent, and experiments have demonstrated that it can be grown over large areas in the United States, although the crop is uncertain and in point of yield and quality considerably inferior to lowland rice produced by irrigation.

The straw, hulls, and ashes of rice are also valuable, being available as fodder for live stock and for fertilizers, while rice polish and rice bran are also valuable. According to recent expert estimates, rice polish is worth \$21.55 per ton; rice bran, \$20.80; rice straw, \$9.13; and rice hulls, \$8.34.

Richards, Theodore William. American chemist b. Germantown, Pa., 31 Jan. 1868. He was graduated from Haverford College B.S. 1885; A.B. Harvard University 1886, A.M., and Ph.D. 1888, and received the honorary degree of Sc.D. from Yale University in 1905. He studied chemistry at the Universities of Gottingen and Leipzig and at the Technical School in Dresden, and was appointed assistant professor of chemistry at Yale University in 1894 and professor in 1901. He was advisor to the Carnegie Institute, Washington, D.C., was chairman of the Chemical department of Harvard University, and exchange professor from Harvard to Berlin University in 1907. Doctor Richards was an investigator in physical and inorganic chemistry and has revised atomic weights of oxygen, copper, borium, strontium, chlorine, potassium, nitrogen, silver, and sulphur. He was awarded the Davy medal for his researches on the determination of atomic weights, by the Royal Society of London. He is a member of the National Academy of Sciences; honorary member of the Royal Institution of Great Britain; fellow of the American Academy of Arts and Sciences; the American Philosophical Society; the Washington Academy of Sciences; and a member of the American Association for the Advancement of Science, and of the American Chemical Society.

Rivers and Harbors Congress, National. Attended by one of the largest gatherings of waterway enthusiasts that ever assembled to discuss waterway improvement, the seventh annual convention of the National Rivers and Harbors Congress met at Washington, D.C., on 7 Dec. 1910. The sessions extended over three days. The first of those was given over chiefly to speeches of welcome, the opening address being made by President Taft. In the course of the second day's proceedings Representative Champ Clark, of Missouri, aroused considerable enthusiasm by declaring that the House of Representatives stood willing to adopt a feasible, practicable, comprehensive scheme

RIVERS AND HARBORS CONGRESS—ROADTOWN MOVEMENT

for the improvement of the waterways of the United States, if any could be made. Among the others who made speeches during the second day's proceedings having to do with various phases of the national waterways situation were Governor Judson Harmon, of Ohio; Brigadier-General William H. Bixby, chief of the United States Engineer Corp, Clifford Sifton, chairman of the Canadian Conservation Commission, and Frederick A. Delano, president of the Wabash Railway Company. The meetings culminated on 9 December. The resolutions adopted at that session commended the attitude of President Taft and urged the annual appropriation of \$50,000,000 by Congress for the improvement of waterways, to be paid out of current revenues where possible, otherwise by the issuance and sale of bonds. It was declared, however, that the congress favors such bond issues only for permanent improvements and that the amount of any issue shall be limited to the requirements of the years of issue. It was also urged that the United States Corps of Engineers be increased sufficiently to care adequately for the projects upon which they will be required to pass, and that the powers of the Interstate Commerce Commission be enlarged to give that body effectual authority to regulate competing land and water carriers. At the conclusion of the session the board of directors met to plan for the work of the coming year, while a special committee went to the White House and Capitol to present resolutions to the President, Vice-President, Speaker of the House, and chairman of both the Senate and House Committees on Waterways. All the officers of the congress who officiated during 1910 were reelected for the ensuing year. The National Rivers and Harbors Congress is a very large organization, with members in all quarters of the United States, which has as its object the conservation and improvement of the nation's waterways of all sorts. The activities of the society are great and extend throughout the year, a great part of the work being of an educational and inspirational character. See RIVERS AND HARBORS CONGRESS, WOMAN'S NATIONAL.

Rivers and Harbors Congress, Woman's National. The Woman's National Rivers and Harbors Congress is a nation-wide organization of public spirited and very active women who are doing all in their power to spread the doctrine of conservation. The avowed objects of the organization are the improvement and development of the maritime waterways of the nation, the preservation of the forests, and the conservation of all natural resources, and it stands for a definite policy by the Federal Government for the development of these natural resources commensurate with needs of the present and the needs of the future so far as they can be foreseen. The congress conducts a continuous educational campaign in clubs, schools and colleges, by the aid of the press, and by pamphlet and lecture, as well as by personal communication. It was through its efforts that the General Federation of Women's Clubs was induced to add a standing committee on waterways to its list, while the general activities of the congress's work have been adapted to the needs of the individual States and localities so that it may continue uninterrupted at all times. The organization's educational campaign covers in its scope conservation of water

for all of its uses—principally, however, giving attention to navigation, municipal supply, irrigation, and power. The inter-relation of forest and stream, and the need of preservation and extension of the forests, together with the non-pollution of maritime waterways and waterfronts form the burden of the society's constant slogan. Organized at Shreveport, La., in June 1908, at a time when an almost unprecedented flood was occurring in the rivers of the Mississippi Valley, the Women's National Rivers and Harbors Congress to-day has 40,000 members enrolled, representing all parts of the country. In order to facilitate the work it has undertaken, this organization works in cooperation with the National Rivers and Harbors Congress. The society also includes a membership of several hundred from Hawaii. The year 1910 was one of unusual activity in the congress, and much valuable work was accomplished, although most of it was of an inspirational character. Mrs. Hoyle Tomkins, of Shreveport, La., is the honorary president of this organization, and Mrs. A. Barton Miller, of Charleston, S. C., the acting president.

Rives, Amelie. See TROUBETZKOY, PRINCESS AMELIE.

Roads, Good. See GOOD ROADS MOVEMENT.

Roadtown Movement. A project which may be of considerable economical import was begun in 1909 by Edgar S. Chambless, of New York City. This plan, which gained still further headway during 1910, is known as the Roadtown Movement. Its main object is the solving of the present involved problem of congestion. It is based upon the theory that the real cause of the density of population in cities is because of the greater personal comforts obtainable in metropolitan districts. Mr. Chambless believes that if the comforts of the city could be brought to the farm the question of congestion would very soon solve itself. The means of doing this he has perfected in his plan of Roadtown, which he is preparing to give to the world free of charge. The Roadtown is a line of city projected through the country. The strip of city is in the form of one long, continuous house. In the basement are to be placed means of transporting passengers, freight parcels, and all things which can be carried by pipe or wire. The entire structure can be made of cement, and Thomas A. Edison has donated his cement house patents to be used for Roadtown construction. Mr. Edison figures that he can build a seven-room house for \$1,200, but in the case of the Roadtown structure this cost would be even less since, because of the continuous nature of the building, one wall would be entirely eliminated. Another cost-reducing device is the building of a railroad in the basement, which will be constructed before anything else and used as a line for a work train, thus eliminating wagon haulage, now one of the chief items of expense in cement building. One of the essentials of the Roadtown scheme is a noiseless railroad, several of which are already in existence. From each house a stairway will lead down into the endless basement where the trains should run with no more disturbance to the tenants than is caused by elevators in apartment houses to-day. Another stairway will lead up to the roof, where there will be a promenade. In winter this may be inclosed in glass and steam

ROADTOWN MOVEMENT — ROBINSON

heated. The railroad in the basement and the promenade on the roof will be the only roads or streets needed in the Roadtown, and thus will allow the windows and doors on both sides of the house to open onto private gardens. By a hedge arrangement each family may have its own yard, while, with sound proof walls between each individual house, and the window and door arrangement as planned, each family will enjoy as much privacy as is now possible in any village home. In the continuous basement underneath the house will be placed pipes and wires bringing into every home the ordinary modern conveniences of the city such as steam heat, hot and cold running water, gas for cooking, electric light, telephones, etc. At present the installation of these conveniences entails the digging up and replacing of the pavement in front of a house, the tearing open of cellar walls, and much resultant expense. The construction of Roadtown, on the other hand, would do away with all this and so bring these comforts within the range of practicability. In the same way there could be installed in Roadtown homes a vacuum for suction dusting and sweeping, an extra pipe for distilled drinking water, telharmonic or other electrical music, the automatic telegraph, and the loud speaking telephone, which can be heard throughout the room. The use of the latter has already been donated to Roadtown by its inventor, K. M. Turner.

The type of railroad Mr. Chambless thinks best suited to the purposes of Roadtown is the Boyes Electric Monorail system, in which gearing is eliminated, while leather-faced wheels make for silence in running. The passengers could enter the cars from either side, and things could be so arranged that wrecks would be practically impossible. The patents of this system have also been donated for the use of Roadtown. The Roadtown will require three tracks, placed one above the other. The upper track will be for local service and will have stations at about every tenth house, which will be reached by the continuous passageway onto which the doors of each house will open. About every four or five miles will be an express station, the two lower tracks being reserved for express service, one for trains in each direction. Between the express passenger stations at frequent intervals will be freight stations, where goods may be loaded or unloaded at night, when traffic is light. A dumb-waiter shaft will extend from each house and be connected with a chute so that parcels may be delivered to it from passing cars. This dumb-waiter can be made to perform the upward trip automatically after each passage of a car, and the bundle or letter slid off into an alcove in the room above. In like manner waste paper, garbage, etc., will be placed in suitable receptacles and collected at such hours as will not interfere with traffic.

One of the most significant features of Roadtown is that a perfect mechanical system makes cooperation of all kinds more feasible under existing conditions. With a small serving centre located every thousand feet beside the track it would be possible to send a daily menu into each home from which meals could be ordered by telephone and delivered in heated or chilled receptacles as desired. The dishes could be sent back to the cooking centre and washed according to the method now employed

in hotels. The continuous line of houses will be broken here and there by domed projections in which will be schools, dance-halls, theatres, moving picture entertainments, musical recitals, libraries, museums, and churches. The string of gardens would be similarly broken by playgrounds, ball grounds and amusement parks. The houses in Roadtown will vary in width according to the class for which each particular section is built. A width of 21 feet gives about 250 eight-room, two-story houses to the mile. With a house-width of 26 feet, or 200 houses to the mile, there will be 3 2-10 acres per family within a half mile of the house line. It has been proved over and over again that a man can make a living from such an area. Of course many crops could not be grown on such a small territory or under such conditions, but those could be grown on land located somewhere in the vicinity. Those who do not pursue agricultural activities could live at Roadtown, enjoy all its conveniences at greatly reduced cost, and commute back and forth to their work exactly as so many thousands of people do to-day.

Mr Chambless proposes that Roadtown shall be built and managed by an efficient corporation, with provision that its ownership ultimately pass into the hands of the inhabitants. The present plan is that Roadtown bonds paying a rate of interest not to exceed 5 per cent will be sold to the investing public to raise building, equipment, and operating funds, and that the stock will be non-interest bearing to protect the tenant for all time against graft. The Roadtown tenant will be required to pay such rental as will meet running expenses and interest, and pay off the principal in 10 to 50 years. After the tenant has paid off his original principal, which may be then used in extending the work or returned to the original investor as is thought best, he will become the owner of bonds representing the value of his own home, and of common utilities. There will be no landlords in Roadtown, save the parent corporation. When a man wishes to leave the colony his contract or bond, if he is a fully paid up member, will be liquidated upon an equitable basis. It is planned to build the first lines of Roadtown in New England, New Jersey, Western Europe or Japan. A Roadtown from New York to Boston would cost \$200,000,000—less than the cost of the contemplated improvements in the New York City waterworks—and would provide homes for 580,000 people. The first Roadtown will probably be built on a small scale, however, and be extended as it proves its efficiency and economy.

Robinson, Edward, director of Metropolitan Museum of Art, New York City. b Boston, Mass., 1 Nov. 1858. He was graduated from Harvard University A.B. 1879, and went abroad to continue his studies in Greece and at the University of Berlin, 1879-84. He returned to Boston, and was curator of classical antiquities in the Boston Museum of Fine Arts, 1885-1902; director of the Museum, 1902-05. He was lecturer on classical archaeology at Harvard University 1893-94, and in 1898 was engaged by the Slater Memorial Museum of Norwich, Conn., to select and arrange collections, in which work he was engaged for four years. He also selected and purchased collections and casts for the Metropolitan Museum of Art, New York City, and superintended the rearrange-

ment of casts for the Art Museum of Springfield, Mass.

In 1906 he removed to New York to become first assistant to Sir Caspar Purdon Clark, director of the Metropolitan Museum. Mr. Robinson is a fellow of the American Academy of Arts and Sciences, a corporate member of the Oriental Society, an officer of the Prussian Order of the Red Eagle, and vice-president of the Archaeological Institute of America. He is the author of many works on Greek and Roman antiquities and catalogues on classical casts, including 'Did the Greeks Paint Their Sculptures,' published in the *Century Magazine* in April 1892. The honorary degree of LL.D. was conferred on him by the University of Aberdeen, Scotland, in 1905. He was a member of the committee on art exhibits of the Hudson-Fulton Celebration and was one of the chief promoters of the Whistler memorial exhibition held in the spring of 1910. On the resignation of Sir Caspar Purdon Clark, Mr. Robinson served as acting director and at a meeting of the trustees of the Museum, held on 31 Oct. 1910 he was unanimously elected director of the Museum.

Robinson, Henry Douglas, missionary P. E. bishop of Nevada, and 237th in succession in the American episcopate: b. Lowell, Mass., 15 March 1860. He was graduated from Racine College A.B. 1884, A.M. 1887, and took a post-graduate course at the University of Chicago in 1895. He was ordered deacon in 1886 and ordained to the priesthood in 1888 and was instructor of mathematics at the San Mateo, Cal., Military Academy, 1885-89; head master, 1889-90; and was appointed warden of the Racine College Grammar School in 1890. On 25 March 1908 he was consecrated bishop of Delaware to succeed the Rt. Rev. Leighton Coleman, D.D., deceased. The honorary degree of D.D. was conferred on him by Racine College in 1902. He is a member of the Wisconsin Academy of Sciences, Arts and Letters, and was president of the standing committee of the diocese of Milwaukee.

Rockefeller Foundation. In March 1910 Mr. John D. Rockefeller set on foot a scheme to distribute a large amount of his wealth, for the avowed purpose of uplifting humanity all over the world, by organizing his philanthropic work through the United States Government. At his request Senator Gallinger introduced a bill in the Senate creating the "Rockefeller Foundation," which in the language of the bill, was "to promote the well-being and advance the civilization of the peoples of the United States and its territories and possessions, and of foreign lands, in the acquisition and dissemination of knowledge, in the prevention of suffering, and in the promotion of any and all the elements of human progress." It was generally understood at that time that Mr. Rockefeller intended to limit his gifts of money thereafter to this Foundation, but such has not proved to be the case. His son, John D. Rockefeller, Jr., who was named as one of the incorporators of the project, announced that he intended to devote his life to the management of the Foundation.

The bill was severely criticised by Hon. John Bigelow, by Edward T. Divine, by President Jacob Gould Schurman of Cornell, and by many others. In an address before the National

Association of State Universities, on 15 November, President Schurman said:

"Under the terms of this proposed board charter, there is scarcely anything which concerns the life and work of individuals and nations in which the Rockefeller Foundation would not be authorized to participate. As the safety of the State is the supreme condition of national civilization, the Foundation might in time of war use its income or its entire principal for the defense of the republic. In time of peace it might use its funds to effect economic and political reforms which the trustees deemed essential to the vitality and efficiency of the republic. The Foundation might become the champion of free trade or protection, of trusts or of the competing concerns out of which they grow, of socialism or individualism, of the programme of the Republican party or the programme of the Democratic party.

"It might endow the clergy of all religious denominations or it might subsidize any existing or any new religious denomination. Tomorrow it might be the champion of the Christian religion and 100 years hence furnish an endowment for the introduction of Buddhism into the United States. It might build tenement houses for the poor in New York city or carry the results of sciences to enrich the exhausted soils of the East or the arid tracts of the West. It might set up an art gallery in every city of the United States or endow universities which would rival the great universities of the West.

"These may be likely objects for the application of the funds of the Rockefeller Foundation. I am not, however, attempting to forecast its work, but to understand its charter. And as far as I can see the proposed charter would authorize all of these and a multitude of similar activities.

"Although these are large powers I for one should have no hesitation in entrusting Mr. Rockefeller with them. The experience we have had of his philanthropy shows that he would use them wisely. Vast and comprehensive, therefore, as the scope of this Foundation is, I would not in any way limit or restrict it so long as it was in charge of Mr. Rockefeller or even of his son and his expert coadjutors.

"After they have passed away, however, the situation would be entirely changed. We know nothing about the kind of man who may succeed him, and the objects of the Foundation remaining as important and comprehensive as they are I am decidedly of the opinion that the public should have a right to a voice in the selection of the board after Mr. Rockefeller's direct influence has passed away."

Doctor Schurman said that self-perpetuating boards were practically things of the past in all large institutions and that almost no college or university of to-day is governed entirely by a board so selected. He added: "The plan of a self-perpetuating board for the Rockefeller Foundation is at once contrary to the general practice of our great universities, and, as it seems to me, contrary to the spirit of our age and of our country. A self-perpetuating and irresponsible board wielding enormous powers is from the point of view of efficiency a blunder, and from the point of view of democracy an anomaly, if not indeed a defiance."

Doctor Schurman favored a governing board

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

selected somewhat as in the case of the Smithsonian Institution, which is conducted by a board of regents composed of the Vice-President, the Chief Justice of the United States, three members of the Senate and three members of the House, together with six other persons other than members of Congress, two of whom shall be residents in Washington, and the other four inhabitants of some State, but no two of the same State.

The objection was urged against the bill by the charitable organ *The Survey*, that it would place great resources indefinitely at "the uncontrolled disposal" of a small group of men. Doctor Devine, editor of *The Survey* suggested three amendments as safeguards against abuse. The first was: "The Government should have a voice—naturally by the election of Congress or appointment of the President—in the selection of trustees." His second point was: "It should be stipulated that the annual income during the life of the endowment should actually be expended for the purposes enumerated in the charter, the indefinite increase of the endowments through compound interest being forbidden. His third point was: "That within a specified period, which might properly be 100 years or more, any given endowment should be entirely expended, both principal and interest.

On 12 December, Senator Gallinger introduced a bill providing for various amendments to the proposed charter for the Rockefeller Foundation, to meet the objections that had been raised against it. The total amount of property to be held at one time was limited to \$100,000,000, exclusive of increases in value subsequent to its receipt. To prevent the accumulation by the board of trustees of vast wealth under the charter it was provided that the income from the funds could not be accumulated, but must be expended as soon as a wise administration of the act would permit. Congress was given the power to place limitations upon the use of the fund or property at any time in the future as Congress may deem best for the public interest. Notice of the election of a new member to fill a vacancy in the corporation was required to be sent to the President of the United States, the Chief Justice of the Supreme Court, the President of the Senate, the Speaker of the House, and the presidents of Harvard, Yale, Columbia, Johns Hopkins, and the University of Chicago. The election was to be void if disapproved by a majority of these referees, and it was to become effective when approved by a majority after 60 days. It was also proposed in the amendments that Congress may at any time "impose such limitations upon the objects of the corporation as it may deem the public interest demands" and that any and all gifts and bequests of property "shall be received and held subject to the terms of this proviso and to the terms and limitations which may be imposed by any act of Congress hereafter passed." In effect, Mr Rockefeller proposed to give into the absolute control of the United States for philanthropic purposes the bulk of his great fortune.

Rockefeller Institute for Medical Research. This institution was incorporated 14 June 1901, with Dr. William H. Welch, of Baltimore, president; Dr. T. Mitchell Prudden, of New York; Dr. Christian A. Hester (since died in 1910); Dr. Theobald Smith, of Boston;

Dr. Hermann M. Briggs, of New York; Dr. Simon Flexner and Dr. L. Emmett Holt, of New York (secretary and treasurer), for a board of scientific directors. Mr Rockefeller pledged \$200,000 to the board to be drawn upon at their discretion during a period of 10 years, for preliminary work, his letter of gift expressing his desire "to accomplish the most for humanity and science." Scholarships and fellowships were created and distributed to the existing laboratories throughout the country, to enlist the cooperation of various investigators, to aid some promising lines of research which could not previously be continued for lack of funds, and to discover who and where were the persons who desired to undertake research work and what were their qualifications. At the end of the first year it was decided to centralize the most important lines of work in the Institute's own laboratory under a competent head, and with special equipment. Mr. Rockefeller gave \$1,000,000 at the second annual meeting of the board in June 1902 for this object. The Schermerhorn property, fronting East River at East 66th and 67th streets, New York, was chosen for the site, and a plot comprising 26½ city lots, upon which the present building stands, was deeded to the Institute. Dr. Simon Flexner resigned his position as professor of pathology in the University of Pennsylvania to become director of the Institute and began his work 1 July 1903. The cornerstone of the building was laid 3 Dec. 1904, a building at the corner of Lexington avenue and 50th street being used temporarily.

The present organization provides for the following departments: pathology, bacteriology, physiological and pathological chemistry, physiology, comparative zoology, pharmacology, and experimental therapeutics.

The purpose of the Institute is research, not instruction; yet it exerts a considerable influence on medical education. Upon the basic sciences above mentioned the future discoveries on medical science must largely rest. The Institute endeavors to apply the latest discoveries in science to problems connected with the prevention and cure of disease.

The Institute has cooperated with the Health Department of New York in the study of conditions surrounding the production and distribution of the milk supply of the city, and the effects of milk upon the health of children in the tenements; also with the commission appointed by the city in 1904, to study the prevalence of the acute respiratory diseases, and with that appointed in 1905 to investigate cerebro-spinal meningitis. It has united with Harvard University in sending men to Manila to study certain phases of smallpox; and it has made grants each year to assist important investigations which were being carried on in various places.

The work done by the Institute is published in various scientific journals and collected in volumes of "Reprints." In Feb 1905 the Institute took charge of the publication of *The Journal of Experimental Medicine*.

Mr. Rockefeller gave an additional \$3,820,000 when the hospital of the Institute was opened on 7 Oct. 1910. This made the income bearing endowment \$6,420,000, and the total endowment including grounds and buildings \$8,240,000. In the hospital the closest scientific study is given to obscure pathological condi-

tions such as heart disease, pneumonia and infantile paralysis. The board of trustees of the Institute consists of John D. Rockefeller, Jr., Frederick T. Gates, William H. Welch, Starr J. Murphy, and Simon Flexner.

Roland, Romain, French author: b. Clamercy, France, in 1866. He was educated in Paris and Rome. In 1890, while in Rome, he met a German lady, Malwida von Meysenburg, whose knowledge of men and public affairs aided him in discovering and formulating his own ideas, which were already strongly Tolstoyan. She had taken refuge in England after the Revolution of 1848, and there knew Kossuth, Mazzini, Herzen, Ledin, Rollin, and Louis Blanc; and, later, in Italy, she counted among her friends Wagner, Liszt, Lenbach, Nietzsche, Garibaldi and Ibsen. This lady, who died in 1903, wrote 'Memories d'une Idéaliste' in which she said of Roland "In this young Frenchman I discovered the same idealism, the same lofty aspiration, the same profound grasp of every great intellectual manifestation that I had already found in the greatest men of other nationalities." On his return to Paris, M. Roland became associated with a movement toward the renaissance of the theater as a social machine, and wrote several plays. He has since been a musical critic and a lecturer on music and art at the Sorbonne. He has written lives of Beethoven, Michael Angelo, and Hugo Wolf. His endeavor has always been the pursuit of the heroic. The last words of his 'Life of Beethoven,' which are the last words of Beethoven himself, are: "La devise de tout âme héroïque." His widely discussed 'Jean Christophe' is his greatest work. In the preface to the American translation (not yet complete at the beginning of 1911), Gilbert Cannun says that Roland always conceived and thought of the life of his hero as a river, and the story, if it has any plan, is so told. It flows on without plot or literary artifice. The river is explored as if it were uncharted. Nothing that has ever been said or thought of life is accepted without being brought to the test of Jean Christophe's own life. In the novel his hero is hurled against compromise and untruth, individual and national. He discovers that the Germans lie very quickly; and the French lie and grimace at him as soon as he sets foot in Paris. M. Roland writes in his preface, "To the Friends of Christophe," which precedes the seventh volume, 'Dans la Maison': "I was isolated: like so many others in France I was stifling in a world morally inimical to me. I wanted air, I wanted to react against an unhealthy civilization, against ideas corrupted by a sham élite. I wanted to say to them 'You lie! You do not represent France!' To do so I needed a hero with a pure heart and unclouded vision, whose soul would be stainless enough for him to have the right to speak; one whose voice would be loud enough for him to gain a hearing. I have patiently begotten this hero. The work was in conception for many years before I set myself to write a word of it. Christophe only set out on his journey when I had been able to see the end of it for him."

Roman Catholic Church. See CATHOLIC CHURCH.

Roosevelt, Theodore, American statesman and author: b. New York, 27 Oct. 1858. He was graduated from Harvard in 1880 (A.B.);

entered political life, was elected to the New York Legislature (1882-84), and in 1884 was a delegate to the Republican National Convention. From 1884 to 1886 he resided on a North Dakota ranch. In 1886 he was a candidate for mayor of New York, from 1889 to 1895, a United States Civil Service Commissioner; 1895-97, president of the New York Police Board; and 1897-98, Assistant Secretary of the Navy. The navy position he resigned to organize with Surgeon (now Major-General) Leonard Wood, a regiment of Volunteer Cavalry (the First), popularly known as Roosevelt's Rough Riders. He was Lieutenant-Colonel of this regiment which did distinguished service in Cuba in the Spanish-American War, and was promoted Colonel for gallantry in the action at Los Guasimas.

From 1 Jan. 1899 to 31 Dec. 1900, he was Governor of New York State; and Vice-President of the United States 4 March 1901, until the death of President McKinley 14 Sept. 1901, when he succeeded to the Presidency. On 8 Nov. 1904 he was elected President by the largest popular majority ever given to a Presidential candidate. His term was to 4 March 1909.

Soon after his retirement from the Presidency, Mr. Roosevelt went to British East Africa, where he spent nearly a year collecting zoological specimens for the National Museum and studying the geographical distribution of the animals of that region. With him were his son Kermit, Doctor Mearns and Mr. Heller, of the Smithsonian Institution, and Mr. Loring. In April they left Mombasa for the interior. Many dire predictions were raised regarding his ability to withstand the climate, but he retained his usual excellent health and his collection of trophies is one of the most complete in the world. Mr. Roosevelt personally secured two reticulated giraffe, five splendid specimens of the white rhino (only two poor ones having previously been brought into civilization) and three giant eland, the first to be acquired by any museum. Altogether, the party secured about 11,000 specimens, including 5,000 mammals, 4,000 birds, 2,000 reptiles, 500 fishes, a series of African birds, and hundreds of botanical specimens. During his absence Mr. Roosevelt contributed to *Scribner's Magazine* chapters of a book entitled 'African Game Trails,' describing the progress of his expedition. Aside from a few specimens sent to the American Museum of Natural History in New York as a personal gift to Mr. Akeley, and an elephant sent to the University of California, all the specimens he secured went to the Smithsonian Institution.

On his way home he made a speech in Cairo on 28 March 1910, in which he strongly upheld the British rule in Egypt and denounced in vigorous terms the assassination of Premier Boutros Pasha Ghali. He touched thereby the quivering nerve of Egyptian Nationalism. In his audience were Prince Ahmed Fouad who was president of the faculty of the University of Cairo, the students of the University who for the most part were Nationalists, and a number of British officials, including Sir Eldon Gorst and Lady Gorst. He said the assassination (which had occurred a month before) was a greater calamity to Egypt than the wrong to the man himself; that the assassin stood at the pinnacle of infamy, and that those who were

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apologizing for or condoning his act occupied the same position. The assassin himself had not yet been tried, and the arraignment was one neither Egyptian nor Englishman dared make. On 31 March, the Young Egypt committee published a protest against the speech, declaring the remarks were offensive to the whole nation and were made only with the object of pleasing his official hosts. It was generally recognized, however, that it would aid in promoting a stable, just, and enlightened form of government in Egypt. The speech was one of four that Colonel Roosevelt delivered in Cairo, each being before audiences differing in nationality, religion, thought, and education and aroused enthusiasm by his forceful handling of the religious, political, scientific, and social questions which he discussed.

On 3 April 1910, the press received correspondence between a representative of Mr. Roosevelt and Cardinal Merry del Val, papal secretary of state, withdrawing from a proposed audience with the Pope on the ground that the Cardinal expected of him a pledge not to be present at a meeting of the Methodist mission in Rome. That he might give Americans in Rome an opportunity to meet him, he soon after held a reception at the American Embassy, invitations being extended to the Catholic College as well as to other American organizations. The little Italian city of Porto Maurizio made him an honorary citizen and named a new street after him.

On 10 May, he was the guest of the Emperor of Germany; on 31 May, on the occasion of his receiving the freedom of the city of London, in an address to the Guildhall he warned the British people against oversentimentality in Egypt. His criticism of the British colonial policy as lacking in vigor, it was later explained, had been read in advance by English statesmen in authority, as was the case also with his Cairo speech. His London address had direct results in Parliament. Sir Edward Grey, the foreign secretary, said in a debate on the subject of conditions in Egypt: "The agitation against the British occupation in Egypt can have but one result, whichever party is in power, and that is to lead to more assertion of our authority and our intention to see our work maintained."

Colonel Roosevelt delivered the following formal addresses during his European trip: On 23 April, at the Sorbonne, Paris, on "Citizenship in a Republic"; 5 May, the Nobel Prize Address at Christiania, on "International Peace"; at Berlin, on "The World Movement" 12 May; and at Oxford University, on "Biological Analogies in History," 7 June. He represented the United States in London at the funeral of King Edward VII, by whom he had expected to be personally welcomed in England, but who died on 6 May.

He returned to America 18 June 1910, and was accorded a reception in New York that was a very notable one of its kind. It consisted of a meeting with a reception committee down the Bay, an address of welcome by Mayor Gaynor at Battery Park, and a military parade with an escort of Rough Riders. He then went immediately to his home at Oyster Bay.

While in Cambridge, Mass., on 29 June 1910, as president of the Harvard Alumni Association, he met Governor Hughes of New York,

who sought his support of a primary law which the Republican legislature of New York was unwilling to pass. Although Colonel Roosevelt's friends in the legislature attempted to put it through in the next few days, and a special session was called to consider the measure, the session adjourned without action. On 15 August at a meeting of the New York State Republican committee, Colonel Roosevelt was nominated for temporary chairman by Lloyd C. Griscom, chairman of the Republican city committee, but by the efforts of Timothy L. Woodruff, State chairman, and William Barnes, Jr., chairman of the executive committee, Mr. Sherman, Vice-President of the United States, was chosen over him by a vote of 20 to 15. Colonel Roosevelt resented this action and his friends accused the "regular" party leaders of sharp practice in stating that President Taft favored the choice of Mr. Sherman. The President, however, explained in a public letter, 22 August, that he had asked the party leaders to consult Mr. Roosevelt and his friends before taking action. On 27 September in convention, Roosevelt was elected temporary chairman by a small majority, and the Regulars were defeated. Colonel Roosevelt had refused to be considered a candidate for Governor, and Henry L. Stimson was nominated on a platform drafted by Roosevelt's friends, which declared in favor of direct primaries and endorsed, though weakly, the Payne-Aldrich tariff. Colonel Roosevelt then went through the West and South on a speaking tour, speaking from 1 to 10 times a day. At Ossawatimie, Kan., on 31 August, at a celebration nominally in honor of John Brown, he announced the platform of what he called "New Nationalism" (qv). It contained 17 planks, seven of which related to trusts and corporations; three to finance, including a tariff commission, and a graduated income tax; one to the army and navy, two to the conservation of natural resources; one to legislation favorable to labor; one to mob violence, one to the use of national power, and the others to direct primaries, a corrupt-practices act, and the right to recall elective officers. It embodies some of the principles endorsed by Mr. Bryan and other Democratic statesmen, as well as those of progressive Republicans. His speeches were continued in Massachusetts, New Hampshire, Ohio, and other States, and he thoroughly canvassed New York State up to the eve of election. Mr. Stimson was defeated and John A. Dix his opponent was chosen Governor of New York by a plurality of 67,000.

Colonel Roosevelt has received the degree of LL.D. from Columbia (1899); Hope College (1901), Harvard (1902), Northwestern (1903), University of Chicago (1903), University of California (1903), University of Pennsylvania (1905), Clark University (1905), and George Washington University (1909). In 1906, he was awarded the Nobel Peace Prize of \$40,000. With this he endowed the Foundation for the Promotion of Industrial Peace. He is the author of "Winning of the West" (1889-96); "History of the Naval War of 1812" (1882); "Hunting Trips of a Ranchman" (1885); "Life of Thomas Hart Benton" (1886); "Life of Gouverneur Morris" (1887); "Ranch Life and Hunting Trail" (1888); "History of New York" (1890); "The Wilderness Hunter" (1893);

'American Ideals and Other Essays' (1897), 'The Rough Riders' (1899); 'Life of Oliver Cromwell' (1900); 'The Strenuous Life' (1900); and 'Works' (8 vols, 1902). He is also part author of 'Hero Tales from American History' (1895); 'The Deer Family' (1902); and 'Outdoor Pastimes of an American Hunter' (1906). He has been contributing editor on the staff of *The Outlook* since his retirement from the Presidency.

Roots, Logan Herbert, second missionary P. E. bishop of Hankow, China, and 221st in succession in the American episcopate b. in Perry county, Ill., 27 July 1870. He was graduated from Harvard University A.B. 1891, attended the Harvard Graduate School, and was graduate secretary of the Harvard Christian Association and travelling secretary of the Young Men's Christian Association. He entered the Cambridge Episcopal Theological School, Mass., and was graduated B.D. in 1896; was ordered deacon the same year, and ordained priest in 1898. In 1896, he went to China and resided at Wuchang until 1898, when he removed to Hankow and engaged in missionary work. He was elected bishop of the missionary district of Hankow, to succeed the Rt. Rev. J. Addison Ingle who died 7 Dec. 1903, and was consecrated at Boston, Mass., 14 Nov. 1904, Bishops Lawrence, McKim, and Graves, officiating as consecrators, assisted by Bishops McVickar, Partridge, Vinton, and Van Buren. His district supports 15 foreign and 13 native presbyters, 46 missionary physicians and is composed of 46 stations. The honorary degree of D.D. was conferred on him by the University of the South in 1906.

Roque. See SPORTS.

Roselle. A strictly tropical plant, very sensitive to frosts, which has within recent years been imported into the United States and very successfully propagated here. In roselle the large, fleshy calyces surrounding the seed pod are used for food, making an excellent substitute for cranberry sauce and possessing unexcelled qualities for making jelly. The fiber of the plant can be utilized to advantage in the manufacture of cordage and coarser textile products. In India it is grown particularly for this purpose, and the climate of the Southern States being well adapted to its cultivation, there appears no reason why roselle should not be grown extensively in that section with excellent profit. The United States Department of Agriculture is at present doing all in its power to encourage the growing of roselle, and there are prospects that it may before long attain commercial importance in this country. The plant possesses great vigor, and is easy of cultivation on that account. The leaves are sometimes used for salad, while the seeds are supposed to have medicinal properties, being, on this account, frequently fed to cattle and poultry. The plant is generally very little known, but, on account of its superior properties, it should, now that experts are interesting themselves in it, become more and more common in this country. Already the culture of roselle has assumed very large proportions in Queensland, where it is a most profitable product.

Rostand, Edmund. French dramatist and member of the French Academy: b. Marseilles,

France, 1 April 1868. He was educated at the Lycee de Marseilles and the College Stanislas. His principal plays are 'Les Romanesques' (1894), 'La Princesse Lointaine' (1896); 'La Samaritaine' (1897); 'Cyrano de Bergerac' (1898); 'L'Aiglon' (1900). 'Chantecler,' a poetic drama, the result of years of arduous study, was produced in Paris and London in 1910, achieving instant success, and in Jan. 1911 it was put on the stage in New York, with Miss Maude Adams as Chantecler. In this play the characters are birds, and the motif—"To every man his work."

Rowan, Andrew S., American soldier: b. Virginia, 23 April 1857. Major Rowan is a Virginian, the son of Col. J. M. Rowan of the Confederate Army, and is a graduate of West Point of the class of 1881. He was assigned, as second lieutenant, to the 15th Infantry, was promoted to a first lieutenancy in the 9th Infantry in 1890, and was transferred to the 19th Infantry in 1891. He was last on duty at Fort Douglas, Utah. When first lieutenant in the 19th Infantry, having been military attaché in Chile, and familiar with Spanish, he was selected to go to Gen. Calixto Garcia, in the interior of Cuba, partly on account of his general reputation for bravery, prudence, and skill, and largely because he knew something about the geography of Cuba. He started from Kingston for Cuba in an open sailboat, accompanied by a Cuban guide, and reached the southern coast of Cuba on 24 April 1898. He was thus the first army officer to land on the island after the declaration of hostilities with Spain. He made his way across the country to Garcia's camp, disguised at one time as a Cuban, and at another time as a Spaniard, delivered his message, and returned in the same manner, reaching Nassau, from whence he sailed by schooner for Key West. He was voluntarily retired 1 Dec. 1910, after 30 years' service.

Rubber. The 1910 world's supply of rubber well kept pace with the present prevailing average, which amounts to approximately 200,000,000 pounds. This includes the supply of rubber of all kinds, most of which comes from the tropics or sub-tropics. The belt of rubber-growing territory stretches round the earth, taking in the whole of Mexico, Central America, South America as far south as Argentina, Africa from Cape Colony up to the Sahara, much of Oceanica, Java, Sumatra, Borneo, India, the Malay States, and the Philippines. Nearly all of the growth in these places is wild rubber, the trees, vines, and shrubs which produce it growing in dense jungles. The greatest rubber-producing country in the world to-day is Brazil, whence comes Para rubber. There are two prime factors in the way of the expansion of the Amazonian rubber industry, however. One of them is the high cost of production, and the other the scarcity of labor, and the Brazilians are endeavoring to solve these problems. A rather inferior grade of rubber, but one which nevertheless has added about 22,000,000 pounds a year to the supply of the world's crude rubber, is extracted from a shrub known as guayule, which grows in the desert uplands of Mexico. The thick bark of this shrub contains about 10 per cent of rubber and a highly perfected machinery has been evolved to extract this from the shrub. The rubber of the Far East is of a high grade and

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is constantly increasing in volume. During 1910 an average of 1,200,000 pounds a month was exported, and government experts expect that within three years the supply from this section will be worth \$50,000,000 annually. This rubber costs on an average about 25 cents a pound, being sold at an average of \$1.75. The manufacture of rubber goods, far from being one concrete industry, is in reality several separate industries having two things in common, namely, that all use rubber and all use sulphur. Listed in the order of their importance these industries are mechanical rubber goods, including belting, hose, packing, and matting, insulated wire and cables, rubber boots and shoes; tires, pneumatic and solid; rubber clothing of all kinds, druggists' and surgical supplies; hard rubber, ebonite or vulcanite; dental and stamp rubber; stationers' and artists' sundries; rubber cements; sporting goods; notions; and reclaimed or remanufactured rubber. Each one of these specific lines uses its own compounds and special machinery, having practically nothing in common save that rubber forms the base of the articles produced. The rubber industry is controlled by 10 different trusts, five in the United States, three in Germany, one in Russia, and one in Italy, representing amalgamations of some 50 of the rubber factories of the world. Besides these there are to-day 450 unamalgamated companies. For more than 40 years the daily newspapers have been wont to come forth periodically with scares of rubber famine, but there is really no foundation for alarm. Experts aver that the world's rubber supply is constantly on the increase, and that there can be no doubt that there will always be plenty of rubber on the market. Annually reports are circulated that someone has found a new sort of rubber, but as a general rule these discoveries are the same compounds which have been "discovered" year after year and proved impracticable.

The year 1910, however, brought to light one new type of rubber tree which bears every appearance of possessing possibilities. This is the palo amarillo which grows wild over a large territory in Mexico. The commercial possibilities of this tree as a rubber producer were thoroughly tested by the Mexican Government and by representatives of American interests. A company called the Palo Amarillo Mexican Crude Rubber Company was formed to manufacture crude rubber from the milky sap of this tree, the first plant being opened at Empalme de Gonzales, in the State of Guanajuato. The palo amarillo tree, which bears no resemblance to the guayule shrub from which so much rubber has already been extracted, grows rapidly to a height of about 30 feet, with a trunk one to two feet thick, and reaches a commercial size in five years. During the latter part of 1910, after its operations were well started the new factory averaged a daily output of two tons of crude rubber, which sold for about \$1,000 a ton. The fluid extracted from the palo amarillo tree contains an average of 10 per cent rubber and 25 to 40 per cent resin, which, of course, has a value of its own apart from the worth of the rubber. Another interesting development of the last year in the rubber industry was the rearing of rubber trees in the cold climate of New England by a group of Harvard University scientists. These

trees were imported from China and, although the present experiments have been conducted only along scientific lines and with the greatest care, some of the originators of the scheme believe that the success of the experiments undertaken on a small scale indicates that rubber trees of commercial value, if properly selected, can be grown in New England. Many experts doubt this, but, in view of the experimental results of 1910, there can be no way of knowing positively until the industry has been attempted on a large scale there. See also RUBBER, ARTIFICIAL.

The demand for rubber and the products of rubber increases from year to year, and it is said that, at the present time, more than 100,000 men are engaged in its manufacture in various ways, and between \$150,000,000 and \$200,000,000 are invested in rubber in North America alone. The sale is steadily increasing—barely holding its own with the supply; and partly on this account, partly for other reasons, the search for other substances closely resembling rubber has been constant; and of late years several such substances have been placed upon the market. One of the most successful of these is protal. This is a new industrial plastic substance, the base of which is derived from the plant world,—as the base of rubber is derived from the plant world,—and which may be subjected to such treatment and processes as serve to convert it into a plastic, semi-solid, or solid mass, having characteristics to permit such mass to be mounted, cast, pressed or otherwise formed into shapes, and is possessed of such properties as to permit its use in a number of the arts and sciences. Dr. F. G. Wiechmann, in a recent paper read before the American Institute of Civil Engineers, said:

"To produce the new plastic (protal) the vegetable-albumin is treated by one or more substances, which, it is believed, convert it into a new substance, not only in its physical characteristics, but in its chemical characteristics. . . . When first produced, protal is perfectly plastic, but it soon acquires the hardness of stone, on re-warming, however, it resumes its plasticity sufficiently to permit of its being moulded under pressure in any shape or form. In moulding, it takes sharp and clear impressions."

There are several ways of moulding protal, which are rather too technical for discussion in this place. It possesses many fine qualities; it is odorless, resilient; it can be cut, sawed, filed, polished, etc. It can withstand high temperatures. In some forms, it is a good electric insulator. In tensile strength, pure protal compounds range from 1,000 to 2,110 pounds per square inch. Pigments and colors of all kinds may be mixed with this substance. It is being used more and more extensively.

There are three chief artificial substitutes for rubber at present on the market, which may be divided as follows: (1) rubber substitutes proper, consisting wholly of substitutes other than rubber; (2) composite or artificial rubbers, which contain a certain proportion of natural rubber worked up with other substances; and (3) true synthetic rubber, namely, a product containing the rubber molecule synthesized in the laboratory or factory by chemical means from simpler compounds.

RUBBER—RUMANIA

Commercially, the first of these is the most important. A form of modified oil is the base of all of them. An elastic solid is formed from this by compounding with oxygen, it then thickens on cooling and is afterwards worked up with petroleum Sulphur or nitro-cellulose is sometimes used also.

Of the second class of rubber substitutes, a few examples may be given. "Fenton's rubber" is composed of a mixture of oils with tar, pitch, and creosote. When digested in nitric acid, the mixture results in a toughened mass, which, on heating, yields an elastic product resembling rubber. According to *Nature*, "Russian substitute," said to be useful for covering telegraph cables, contains as ingredients wood-tar, hemp and linseed oils, ozokerite, spermaceti, and sulphur. "Oxolin" is made by impregnating fibrous material such as jute and hemp with linseed oil, oxidizing the oily mass with warm air, and working the product up between rollers into a coherent mass, which can then be vulcanized by heating it with sulphur.

In another category of substitutes, oil plays only a subordinate part, or is altogether dispensed with. Thus "Jones Substitute" is stated to be made from various gums and gum-like products as the chief constituents. "Textiloid" has for its ingredients various resins, nitro-cellulose, and camphor. As a curiosity in this class may be mentioned grape-rubber produced from the skins of grapes by means of pressure; it is not, however, a commercial article. Finally,—though this can only be a substitute for rubber in very hard articles,—we have bakelite (q.v.) recently introduced by Dr. L. H. Bækeland. Of the composite rubbers, one basic material, Guayule rubber, incorporated with gums is used. As yet, no article has been manufactured which replaces rubber in any way perfectly; though there are indications that such a material will be manufactured in the not far-distant future.

Rubber, Artificial. With the world's present enormous demand for rubber, despite the large quantity of real rubber placed annually on the market, the manufacture of artificial rubber has become an industry of vast importance. To-day the various substitutes for rubber consist of three type, as follows: (1) actual substitutes containing no rubber; (2) composite rubbers, in which some natural rubber is worked up with other substances, and (3) true synthetic rubber, chemically prepared. The first of these classes is now the most important from the commercial standpoint. For it scores of recipes are in existence, including very diverse ingredients, but the basis of most is a modified oil. Oxidized, sulphured, and nitrated oils, in one form or another, are largely used as substitutes for rubber. Of other substitutes proposed there are, first, those which add to the oil other constituents, such as tar, pitch, or creosote. "Russian" substitute, useful for covering telegraph cables, contains wood-tar, hemp, and linseed oils, ozokerite, spermaceti, and sulphur. "Oxolin" has a basis of fibrous material such as jute or hemp. "Jones" substitute is made from various gums, while "Perkins" patent substitute gelatin is or glue is dissolved in creosote and then treated with some re-agent, such as tannic acid to render the mass insoluble. Finally there is "bakelite," a condensation-product of formaldehyde and

phenol, which can be moulded as desired and afterward hardened. These substitutes are inferior to natural rubber, but they serve their purpose well in many lines. It is not necessary, for instance, to use such a high grade material for rubber door mats as for tires which are to be subjected to the greatest hardships on the roadways and in climatic conditions. For the former, however, and for like articles, artificial rubber is entirely adequate, besides possessing the added advantage of being much cheaper.

The manufacture of true synthetic rubber is one with which scientists have concerned themselves for years, as yet without any practical success from a commercial standpoint. Latterly, however, all indications point to progress along these lines. Some experimenters express great hopes of caoutchouc, a colloidal hydrocarbon found in the milky juice or latex of certain trees or shrubs. C. Simmonds, the English scientist, believes that a true chemical rubber is fore-shadowed in the so-called "turpentine rubber" made by passing turpentine through a hot tube and treating the resulting vapors with hydrochloric acid. The result is a solid condensation-product. Another method is that outlined by Heinemann's patent of 1907, which attempts a true chemical synthesis starting with mixed acetylene and ethylene gases and ending with a substance closely resembling caoutchouc, if not identical with it. In this regard the question which still remains to be solved and upon which scientists are now hard at work is, can this comparatively simple synthesis, theoretically quite possible as a laboratory operation, be translated into a practicable and profitable mode of manufacture on a large scale? One of the first doubts to arise is whether the synthesized caoutchouc will actually have the physical properties of natural rubber; or whether these, by any course of treatment, can be imparted to it. This doubt resolved, there comes the question of economical production in competition with the natural product. Until these have been solved synthetic rubber will remain chiefly of interest to scientists, but the indications are, in view of recent progress along these lines, that sooner or later a true chemical rubber will make its appearance on the market. When that time comes it promises to have a very significant bearing on the rubber industry. See RUBBER.

Rumania. Rumania is a small inland monarchy in the southeastern part of Europe, with a mixed population having some Oriental characteristics. It owes its importance mainly to its strategic position between Austria-Hungary, Russia and Turkey.

Area and Population — Rumania consists of three main divisions, Wallachia, Moldavia, and the Dobruja, but for purposes of local government is divided into 32 districts, and subdivided into 372 arrondissements and 2,664 communes, 71 urban and 2,593 rural. The total area is 50,720 square miles, and the estimated population in 1909 was 6,775,700, the density varying from 38 inhabitants per square mile in Tulcea to 243 in Ilfov, the average being 117. The nationality of the people is estimated to be, Rumanians, 92.5 per cent; subjects of foreign States, 3.1 per cent; Jews, 4.4 per cent. Of foreigners, the Austro-Hungarians numbered 104,108, the Turks, 22989, and the Greeks, 20,057.

RUMANIA—RURAL SCHOOLS

Among the Rumanians themselves there are important racial differences. In Central Moldavia thousands of the people are of Magyar descent, along the Danube there are great numbers of Bulgarians and Servian origin; there are hordes of Gypsies, and in the Dobruja there are elements of Turkish, Tartar, Russian, and German origin. There are numerous Rumanians in the neighboring countries, Transylvania, Hungary, Bukowina, Bessarabia, Servia, Bulgaria, and Macedonia, and the total number of the Rumanian people is probably between 10,000,000 and 12,000,000. In 1908 there were 272,850 births and 185,393 deaths; surplus of births, 87,457.

The principal city is Bucharest, the capital and seat of Government, with 300,000 inhabitants, Jassy has 80,000, Galatz, 66,000, Braila, 60,000; and there are 7 other towns with a population of between 16,000 and 50,000.

Government.—The present Rumanian Constitution was voted in 1866 by a Constituent Assembly. The present King, Carol I, was born 20 April 1839, the son of the late Prince Karl of Hohenzollern-Sigmaringen, and entered Bucharest as Domn or Lord of Rumania in 1866, on 26 March 1881, he was proclaimed King. On 15 Nov. 1869, he married Princess Elizabeth von Wied. The heir to the throne is Prince Ferdinand, second son of the King's elder brother Leopold, who renounced the right of succession, as did his elder son, Prince Wilhelm. The union of Wallachia and Moldavia was proclaimed at Bucharest and Jassy, 23 Dec. 1861. The first ruler of Rumania was Colonel Cuza, elected Hospodar in 1859, who took the title of Prince Alexandru Joan I. A revolution in 1866 forced him to abdicate and led to the election of the present King. Rumania's independence from Turkey was proclaimed 21 May 1877, and confirmed in 1878, by the Congress of Berlin. Legislative rights are vested in a Senate and a Chamber of Deputies, and the executive in a council of 8 members, the President of which is Prime Minister. The King has a suspensive veto over all laws passed by the two Houses.

Finance.—The budget estimates for revenue and expenditure in 1910-11 were 461,079,942 lei (about \$90,000,000). The public debt in 1909 amounted to \$296,836,150.

Army.—See ARMIES OF THE WORLD.

Navy.—See NAVIES OF THE WORLD.

Education and Religion.—Education is free and compulsory wherever there are schools, but the laws are not very strictly enforced, and in 1899 78 per cent of the population over 7 years of age could not read or write; in 1904, 69 per cent of the army recruits could not read. Education, however, is making rapid progress in recent years. In 1907 the number of rural primary schools was 4,079; the number of urban primary schools, 384; total number, 4,463; total number of teachers, 7,103, and of pupils, 514,637, total school population 897,396. The total number of pupils at boys' schools of a higher grade was 19,280, and of girls' schools, 6,016. The University of Bucharest has 120 professors and 3,422 students, and that of Jassy, 60 professors and 534 students. Only the clergy of the National Orthodox Church are recognized and paid by the State, and of the total population in 1900, 5,408,743 belonged to this church, 168,176 were Catholics or Protestants,

16,598 were Armenians, 269,015 were Jews, nad 43,470 were Mohammedans. In 1903 there were 6,666 churches, 108 monasteries, and 11 mosques.

Agriculture.—Agriculture is the chief, and, in many parts of Rumania, practically the only industry. The arable land was estimated to be thus divided in 1905: ploughed lands, 13,526,100 acres, fallow lands, 1,297,400; vineyards and orchards, 456,500; meadows, 1,213,000, pastures, 2,504,600, forests, less clearings, 5,637,300, water, 1,994,000, other lands, 5,524,700 acres. 41.66 per cent of the total area of arable land belongs to proprietors owning 247 acres or less, and 47.53 per cent to persons owning estates of 247 acres or more. In 1909 the production by crops was as follows.

Crop	Acres	Bushels
Wheat	4,171,940	54,996,900
Rye	347,313	2,994,800
Barley	1,356,400	19,338,500
Oats	1,196,725	25,143,600
Maize	5,244,980	67,970,322
		Gallons
Wine	212,510	27,940,220
		Cwt
Plums	170,900	719,684
Tobacco	20,380	107,558

In 1909, 69,146 acres were under colza, 12,173 acres under flax, yielding 72,389 bushels of seed, 6,462 acres under hemp, and 11,406 acres under sugar beet. The State forests have an area of 1,069,703 acres, of which 921,848 are wooded and the rest cleared, private forests cover 1,492,841 acres, Domain and Crown forests, 71,401; total, including communal and other forests, 2,759,930 acres. Most of this is oak and beech, pine and fir cover 311,120 acres. In 1901 Rumania had 864,324 horses, 2,589,526 cattle, 5,655,444 sheep, 232,515 goats, and 1,709,205 swine.

Exports and Imports.—The chief imports are as follows. Metals, vegetable textiles, ready-made clothing, wool, hair, machinery, vegetables, hides, fruits, trees, timber, and silks. The exports are Cereals and products, wood and timber, petroleum, etc., animal products, vegetable products, hides, living animals, fruits, and mineral waters.

Manufactures and Minerals.—The only considerable mineral products are coal and petroleum. The total output of petroleum springs, government and private, in 1909, was 1,296,403 metric tons. Manufactures consist mainly of such cottage industries as have been carried on from primitive times.

Communications.—In 1909 the merchant navy of Rumania consisted of 495 vessels of 145,166 tons, including 88 steamers. In 1908 1,010 vessels of 1,607,627 tons cleared from the Danube at Sulina. There were in 1908 3,280 post offices, and 3,047 telegraph offices, with 4,756 miles of telegraph lines. There were 7 urban telephone systems with 714 miles of line, and 5,194 interurban systems with 18,608 miles of line.

Social Conditions.—Comprehensive statistics are not available as to crime and pauperism. In 1907 the total number of prisoners convicted was 23,068. There are 168 hospitals and hospices, communal, rural and private.

Rural Schools, Consolidation of. The plan for consolidating the rural schools, to-day one of the most important educational questions before this country, sprang from the fact that present day conditions have advanced

beyond the point where the old style one or two room district school can meet the educational demands of a rural community. By merging several of these schools into one large institution and providing means of transporting children from the more remote districts, greater efficiency is secured, a more thorough equipment and teaching corps is possible, and several communities are brought into close contact and made a harmonious unit instead of so many isolated parts. Increased interest and activity is also secured from the pupils through the establishment of various clubs, such as the debating societies, reading circles, social, athletic and agricultural clubs, etc. Such consolidation, with its attendant function of public conveyance to pupils, is at present a part of the rural-school system of 32 States, and in all of them the consolidation has made for increased economy, efficiency, and interest. The remarkable adaptability of the system of the needs of agricultural communities is to-day attested by 1,800 completely, and about 2,000 partially, consolidated schools. Massachusetts was the first State to take up the consolidation of the rural schools, beginning in 1889, and to-day New England is particularly strong in this system, while, wherever it has been introduced into farming communities, a greatly increased interest and activity along educational lines has been manifested, with a proportionate improvement in general conditions.

Sparseness of population and climatic conditions have had no effect on the success of this movement in which such particular activity has been latterly manifested. It works out as well in Idaho and North Dakota as in Florida, and meets the needs of the rural population of Louisiana as efficiently as it does that of Indiana and Maine. A movement is now on foot looking to the extension of the rural school consolidation plan so that it may embrace the entire United States, and in order to bring about this state of affairs the Government is bringing to bear all the influence at its command. In some communities local sentiment is against the innovation, but, once the economy and manifold advantages of the system become apparent, there appears to be no bar to the spread of this system throughout the country. One of the particular appeals of this consolidation lies in the fact that its plan provides that, outside of school hours, the consolidated school building may be used by the adults of a community, thus furnishing a central meeting place which will make for increased intercourse among the inhabitants of communities. This is a thing much needed in many quarters. A consolidated school building can be put up for from \$8,000 to \$12,000, and be entirely adapted to all needs. By means of this consolidation secondary school education will be brought to an additional 1,000,000 of the approximately 6,000,000 country boys and girls of the United States, and the standard of education for all will be immeasurably improved. Already plans are under way for extended consolidation in Idaho and Minnesota, and it is expected that before the end of 1911 nearly a hundred more counties in various parts of the United States will be sharing in the advantages of this revolutionizing system.

Russell, Charles Edward, American author and journalist: b. Davenport, Ia., 25 Sept. 1860.

His education was at the St. Johnsbury Academy in Vermont. He has been connected with various papers, especially the *New York American*, the *Chicago American* and the *New York Evening Journal*; he has written books, his earliest being 'Such Stuff as Dreams' and the latest 'Songs of Democracy' (1909). Was Socialist candidate for governor of New York, 1910.

Russell Sage Foundation. This work was incorporated under the laws of the State of New York (Laws of 1907, Chap. 140) by Margeret Olivia Sage (widow of Russell Sage), who became president; Robert W. de Forest, vice president, Cleveland H. Dodge, treasurer; Daniel C. Gilman, John M. Glenn, Miss Helen Gould, Gertrude M. Rice (Mrs. William B.) and Miss Louisa L. Schuyler, for the purpose of maintaining a fund (originally \$10,000,000 presented by Mrs. Sage), the income of which shall be used for the improvement of social and living conditions in the United States. The means to this end include research, publication, education, the establishment and maintenance of charitable and benevolent agencies and institutions, and the aid of those already established.

There is a Charity Organization Department (105 E. 22d street, New York), to promote the establishment of charity organization societies in communities in which they are needed, to aid established societies by its studies, publications, correspondence, etc., and to advance the standard of training for workers in this field. Miss Mary E. Richmond is the director, and Francis H. McLean field secretary. There is a Child Helping Department, which conducts inquiries with reference to the condition, needs and care of dependent, neglected, delinquent and defective children, and labors to promote improved methods of dealing with such children throughout the United States. It invites correspondence. The director is Hastings H. Hart. There is the Child Hygiene Department to assist in the development of children's playgrounds, organized games and athletics in schools, wider use of school buildings and grounds, and facilities for public recreation throughout the United States, such as public baths, public school and Sunday school athletic leagues, play festivals and pageants for the celebration of national holidays, and folk dancing, and to study problems relating to the physical, moral and intellectual progress of school children, such as the medical inspection of schools, school feeding, progress through the grades, etc. The director of this Department is Dr. Luther H. Gulick. There is a committee on the Prevention of Blindness to conduct a national campaign to ascertain the direct causes of preventable blindness; and to take such measures in cooperation with the medical profession and others as shall lead to the elimination of such causes.

A little more than a year ago, the Sage Foundation appointed Arthur H. Ham a special agent to help fight the loan sharks. In 1910, he cooperated with the State Superintendent of Banks to secure supervision of the chattel mortgage loan companies operating under the State law allowing an interest charge of 2 per cent a month. As a result, three companies would not renew their licenses and three other companies were in danger of being dissolved.

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and losing their bond of \$5,000 each. The Sage Foundation agent, who is also a member of the executive committee of the National Federation of Remedial Loan Associations, has worked with that committee to secure the passage through Congress of a law regulating the loan business, but, in 1910, without effect.

The Sage Foundation has provided means for a campaign in New York State on the question of tuberculosis. As a result, over \$1,000,000 has been given by cities, counties and individuals in this State for tuberculosis hospitals, dispensaries and other agencies.

The Foundation has made a study of workmen's and other forms of small insurance. It paid for an investigation by Dr. Edward T. Devine of the employment agencies of New York, and as a result the National Employment Exchange was incorporated in April 1909. At the time of the San Francisco earthquake the Foundation made a study of the relief methods employed, the idea being to make the lessons learned there useful in dealing with possible future disasters. The Foundation also financed the now famous Pittsburgh Survey.

Four schools of philanthropy, or schools for social workers, in New York, Boston, Chicago and St. Louis have been enabled by the aid of the Foundation to establish departments for social research. Contributions have been made to the National Red Cross (to secure an efficient director), to the President's Homes Committee of the city of Washington, to the Child Life Saving Congress at Washington, to the recent Child Welfare Exhibit and to many other philanthropic enterprises.

The latest form of work undertaken is the model town of Forest Hills Gardens (q.v.) on Long Island, between three and four miles from Jamaica. It will be unlike most other model towns in that property will be sold to private owners, the Sage Foundation merely retaining large enough holdings to insure a controlling oversight. It is not a charitable scheme in the sense of spending money without hope of receiving a return. The investment is expected to yield a fair interest.

On account of the avalanche of applications for help which followed the \$10,000,000 gift the trustees unanimously reached the following decisions: There shall be no relief of individual or family need, the aim being to eradicate the causes of poverty and ignorance. The sphere of higher education is not within the scope of the Foundation, not so with elementary and other forms affecting social and living conditions, as industrial education. Aid to churches is not within the scope of the Foundation. John M. Glenn (105 E. 22d street) is the director of the Foundation, to whom all communications should be addressed.

Russia. Russia is an Empire occupying the northeastern part of Europe (Russia proper) and the northern part of Asia (Siberia), with the control of the two States of Bokhara and Khiva in Central Asia. It has been variously described as the most easterly of European countries and the most westerly of the Asiatic, and in fact, the traditions, customs and national character partake of the Oriental rather than the European, descending from an age in which Russian life was in its salient features essentially Asiatic.

Area and Population.—According to official data published in 1910 the total population of Russia in Europe and in Asia numbered in 1909, 160,095,200, and was distributed as follows:

Governments and Provinces	Area	Population
European Russia	1,862,524	116,505,500
Poland	49,018	11,671,800
Caucasia	180,603	11,396,400
Central Asiatic Provinces	1,325,530	9,631,300
Siberia	4,780,730	7,878,500
Finland	125,784	3,015,700

Ethnologically the population is divided as follows: 65.6 per cent Russians, 10.6 per cent Turko-Tartaric races; 6.2 per cent Poles, 4.5 per cent Finns and Estonians; 3.9 per cent Jews; 2.4 per cent Lithuanians and Letts; and 1.6 per cent Germans and Swedes. Another classification divides the people into Aryans, Iranians and Armenians, Jews, Uralo-Altayans, including Finns, Samoyeds, Turko-Tartars, Tunguz and Mongols, Georgians and other Caucasians, and Hyperboreans, including Yukaghirs, Koriaks, Chukhis, Eskimos, Ghilaks, Kamchadals, Ainus and others. This shows the heterogeneous nature of the people of the Empire as a whole, ranging from the high civilization of Moscow and St. Petersburg to the savage tribes of the steppes, living in tents and subsisting by hunting or by the most primitive forms of agriculture.

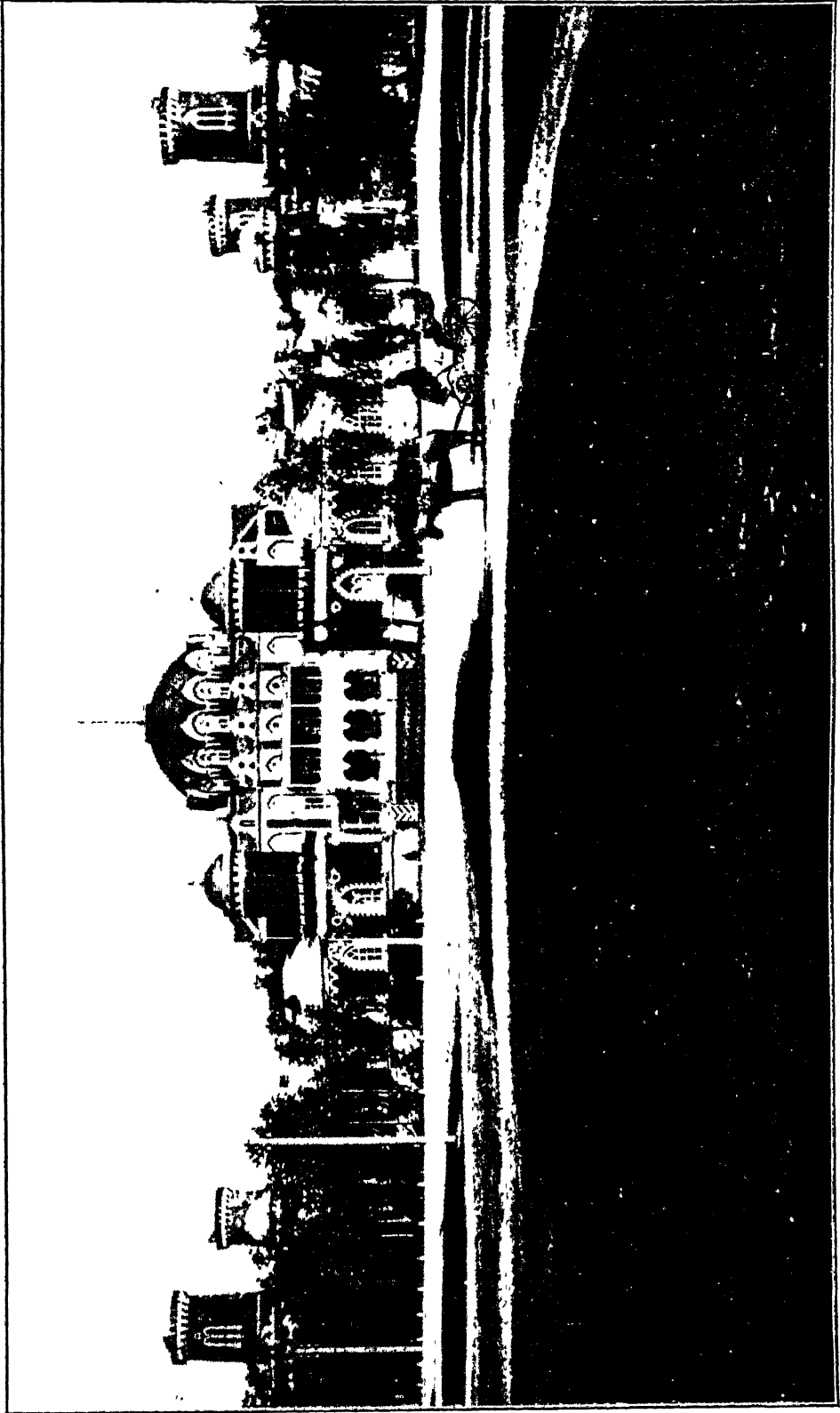
The number of cities having a population of more than 100,000 is 19, of which the largest are St. Petersburg with 1,678,000, and Moscow with 1,359,254. Warsaw has 756,426 and Odessa 449,673. There are 38 cities of population between 50,000 and 100,000, and 118 of from 20,000 to 50,000. The total urban population in 1908 was estimated at 19,832,800. Village dwellers form the great majority of the people.

The emigration in 1906 was 139,050, of which 112,764 persons went to the United States, and all but about 10,000 of the total went through German ports. In 1908 the total migration of Russians and foreigners into Russia exceeded the exodus of Russians and foreigners by about 17,000. The increase of births over deaths in European Russia was in 1904 18.2 per 1,000. In many of the Russian provinces there is a disproportionate majority of women, due to the fact that the men remove to the capitals or the shipbuilding centres during the winter.

Government.—The government of Russia is nominally a constitutional hereditary monarchy, but in fact the whole legislative, executive, and judicial power is centred in the Emperor, whose will is law, and who bears the title of Autocrat. On 6 Aug. 1905, an elective State Council (Gosudarstvennaya Duma) was created, consisting of members elected for five years and representing the governments or provinces and the greatest cities, viz., St. Petersburg, Moscow, Warsaw, Kiev, Lodz, Odessa, and Riga. In that year an unalterable rule was established that no law shall come into effect without the approval of the Duma. Every measure before being submitted for the Imperial sanction must be passed by both the Duma and the Council of the Empire, if rejected, it will not be laid before the Tsar at all.

The present Tsar, Nicholas II, was born 6 May 1868, and ascended the throne at the death of his father, the Emperor Alexander III, 20 Oct. 1894. On 14 Nov. 1894 he married Princess Alexandra Alix, daughter of Ludwig IV, Grand Duke of Hesse. There are four grand-duch-

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THE PETROWSKI PALACE, MOSCOW.

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esses, Olga, Tatiana, Marie, and Anastasis, and the heir apparent is the Grand-duke Alexis, born 30 July 1904

The administration of the Empire is entrusted to great boards or councils possessing separate functions. The most important of these is the Council of Ministers, the president of which is Privy Councillor, Minister of the Interior, Stolypin, appointed to that office 8 July 1906. The ministries are Imperial House and Imperial Domains, Foreign Affairs, War; the Navy, the Interior, Public Instruction; Finance, Justice, General Direction of Land Organization and Agriculture, Ways of Communication, Commerce and Industry, General Control, Procurator-General of the Holy Synod, General Direction of State Studs; and High Commission for the Study at all Points of View of the Railways of Russia (created 21 Sept 1908). The Emperor has two Private Cabinets, one of which is occupied with charitable affairs and the other is devoted to public instruction of girls and to the administration of the institutions established by the late Empress Maria, mother of the Emperor Nicholas I

There are 78 local governments, divided into from 5 to 15 districts, 815 in the whole Empire. In European Russia the country is divided into cantons, and the cantonal assemblies are composed of the delegates of the village communities in the proportion of one man to every 10 houses. The administration of the economical affairs of the district and provinces is to some extent in the hands of zemstvos or district and provincial assemblies, composed of representatives elected by the peasantry, the householders in the towns, and the landed proprietors. Modifications increasing the powers of noble landowners in the affairs of the zemstvos were introduced by the law of 12 June 1890.

The Grand Duchy of Finland, ceded to Russia by the treaty of Fredrikshamn in 1809 has preserved, by special grant of Alexander I and his successors, the Swedish constitution, and has its own Diet

Poland, which had a constitution of its own from 1815 to 1830, and a separate government till 1864, was deprived of the last vestige of independence by ukase of the Emperor 23 Feb. 1868; the use of the Polish language in public places and for public purposes has been prohibited. The Baltic Provinces have also lost their institutions for self-government

Finance—In 1908 the total ordinary and extraordinary receipts amounted to 2,618,667,855 roubles; the balance of revenue from previous years brought this up to 2,650,656,459 roubles. The expenditure, ordinary and extraordinary, amounted to 2,656,682,804 roubles. In 1909 the national debt was 8,835,884,191 roubles.

According to the reports of 1910, there are in all 11,600 small credit institutions with a capital stock of \$141,625,000 operating in the Empire, compared with 9,600 institutions in 1909. Of these 5,833 are share companies, 5,685 peasant land banks and 88 Zemstvo banks. The peasant land banks operate in about 5,000 counties and their borrowers number about 2,000,000. The amount of deposits in the Imperial Russian Savings Banks for the first half of 1910 aggregated \$199,511,000—an increase of \$18,900,500 over the previous year. The Russian State Bank recently celebrated its fiftieth anni-

versary. A meeting of all the private banks in Moscow and St Petersburg was recently called to consider the question of reducing the interest rates on deposits, and the agreement reached was that, in general, deposits shall pay no more than 3 per cent after 14 July 1911. A very large deposit may pay 4 per cent or even more. This action was recommended by the Minister of Finance, and favored by the larger private banks of the two cities

Army.—See ARMIES OF THE WORLD

Navy.—See NAVIES OF THE WORLD

Education and Religion—In Russia proper, according to data published in 1910, only 21 per cent of the total population can read and write. In Poland the literates number 31 per cent, in Russia proper, 23 per cent, in the Caucasus 12 per cent, and in Central Asia 5 per cent. The Baltic provinces have 80 per cent of literates, St Petersburg Province 55 per cent, Moscow 40 per cent and Warsaw 39 per cent

The University of Moscow has 8,083 students; St. Petersburg, 8,090, Kiev, 4,001; Kharkov, 3,450, Dorpat, 1,718, Kazan, 2,821, Warsaw, 1,400, Odessa, 2,851, and Tomsk, 740. A new university was created at Saratov in 1909, and a popular university bearing the name of Gen Alphonse Shaniavsky, who gave the funds for its erection, was founded at Moscow in 1908. There are also theological academies at Kiev, Moscow, St. Petersburg, and Kazan, six medical schools, one of which is military, and others for women, at St. Petersburg, Moscow and Kharkov, Finland has a university at Helsingfors with 2,088 students. Nearly 4,000 students of the total number in Russia are supported by bursaries or released from paying fees. There are various technical schools in addition to those mentioned. According to the data of 1909, the number of all kinds of schools in the Russian Empire was 107,141; number of pupils 6,076,616, of these the pupils of primary schools numbered 5,505,454. There are also 363,777 pupils of private schools and 229,852 attending schools not in the above estimates. The number of pupils attending schools in the various parts of the Empire, per thousand inhabitants, was in European Russia 30.8; Poland, 39.2; Ciscaucasia, 43.6, Transcaucasia, 25.6; Siberia, 32.5; Central Asia, 20.7; of these the proportion of males to females was as 65 to 28.

The established church of Russia is the Greek, officially called the Orthodox Faith. It has its own synod but maintains the relations of a sister Church with the patriarchates of Constantinople, Alexandria, Antioch and Jerusalem. The Holy Synod was established in 1721. The Emperor is head of the Church and appoints to every office, practically, the Procurator enjoys wide powers. All religions except the Jewish have at least nominal liberty, although in some provinces dissenters suffer persecution. The numbers of the various sects, which are not certainly accurate in all cases, are as follows: Orthodox Greek and United Church, 87,123,604; Dissidents, 2,204,596; Armenian Gregorians, 1,179,241; Armenian Catholics, 38,840; Roman Catholics, 11,467,994; Lutheran, 3,572,653; Reformed, 85,400; Baptists, 38,139; Mennonites, 66,564; Anglicans, 4,183; other Christians, 3,952; Karaims, 12,804; Jews, 5,215,805; Mohammedans, 13,906,972; Buddhists,

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433,863; others, 285,321. There were in 1908 1,100 monasteries, 658 for men and 442 for women, with 24,444 monks and aspirants and 69,959 nuns and aspirants. For Roman Catholics there is an Archbishop of Warsaw and another of Mohilev, with six suffragan bishops each. One of the suffragans of Mohilev is of the Graeco-Ruthenian rite, of which there is another bishop immediately subject to Rome.

Agriculture—The ownership of territory in European Russia and Poland is distributed as follows:

Ownership	European Russia Per Cent	Poland Per Cent
State, Imperial Family, Towns, etc	36	7
Peasants	32	6
Private Owners	3	46
Unfit for culture.	28	4

The distribution of land according to its nature in Russia and Poland is as follows:

Nature of Land	European Russia Per Cent	Poland Per Cent
Arable	34	55
Orchards, meadows, hay, etc	16	19
Forests, etc	40	21
Unfit for culture	8	4

The production of the various crops in thousands of pounds (weight) in 1908, in the various parts of the Empire, is shown in the following table:

Crops	Russia	Poland	Caucasia	Siberia	Steppes	Total
Wheat	636,366	35,192	141,272	92,634	40,721	946,188
Rye	1,044,759	120,883	10,858	35,317	2,055	1,213,875
Oats	658,844	58,603	22,052	79,307	16,429	835,237
Barley	395,359	31,620	61,450	8,111	5,775	502,317
Various	285,103	16,593	26,382	4,913	16,040	359,013
Potatoes	1,133,870	608,814	18,782	32,988	4,446	1,798,902
Hay	2,031,341	127,849	138,458	438,425	222,540	2,958,625

The total area in grain in 1910 aggregated 240,419,396 acres, or 6,959,922 acres more than the year before. The number of horses over four years old was 22,999,413; neat cattle numbered 44,270,983; sheep and goats 61,966,959; hogs 12,775,490. At the recent exposition at Odessa there was a good display of stock, and the Podolian bull has been recommended as an animal worthy of note for agricultural experiment in the United States and elsewhere. There has been a movement toward improving the breeds of poultry in Russia in order to meet the demands of the markets of western Europe, but Russian farmers believe that the improvement with better feeding and housing of their own breeds of fowl, will enable them to meet this demand.

In European Russia, Poland, Finland, and the Caucasus the forest area comprises 39 per cent of the total area, while in the two Ural mountain provinces the forests cover 70 per cent of the area. Elsewhere in the Empire the forest area has not been estimated with any degree of accuracy.

Imports and Exports.—Russia holds the first place among wheat-exporting countries. The imports and exports for 1909, in thousands of roubles, were as follows:

Imports	Per 1,000 Roubles
Articles of food	116,810
Raw and half-manufactured articles	411,137
Animals	1,553
Manufactured goods	258,948

788,448
1006

Exports	Per 1,000 Roubles
Corn, flour, buckwheat, etc.	748,298
Eggs	62,212
Dairy produce	48,404
Sugar	15,338
Fish and caviare	5,859
Tobacco and cigarettes	3,691
Meat	3,091
Alcohol, gin and wine	4,831
Total articles of food (including others than these exports)	900,326
Timber and wooden goods	126,092
Naphtha and naphtha oils	32,393
Flax	67,946
Oil cakes	33,651
Oleaginous and other grains	25,779
Furs and leather	34,982
Hemp	12,431
Bristle, hair and feathers	6,268
Wool	6,542
Manganese	7,553
Raw metals, chiefly platinum	21,985
Various	40,352
Fowls and game	12,074
Horses	8,119
Cattle, pigs etc.	4,251
Manufactured goods	24,729
Total exports	1,366,373

The chief exports to Germany are cereals, eggs, timber and flax; to the United Kingdom the same; to the Netherlands cereals and timber, and to France and Belgium cereals and flax.

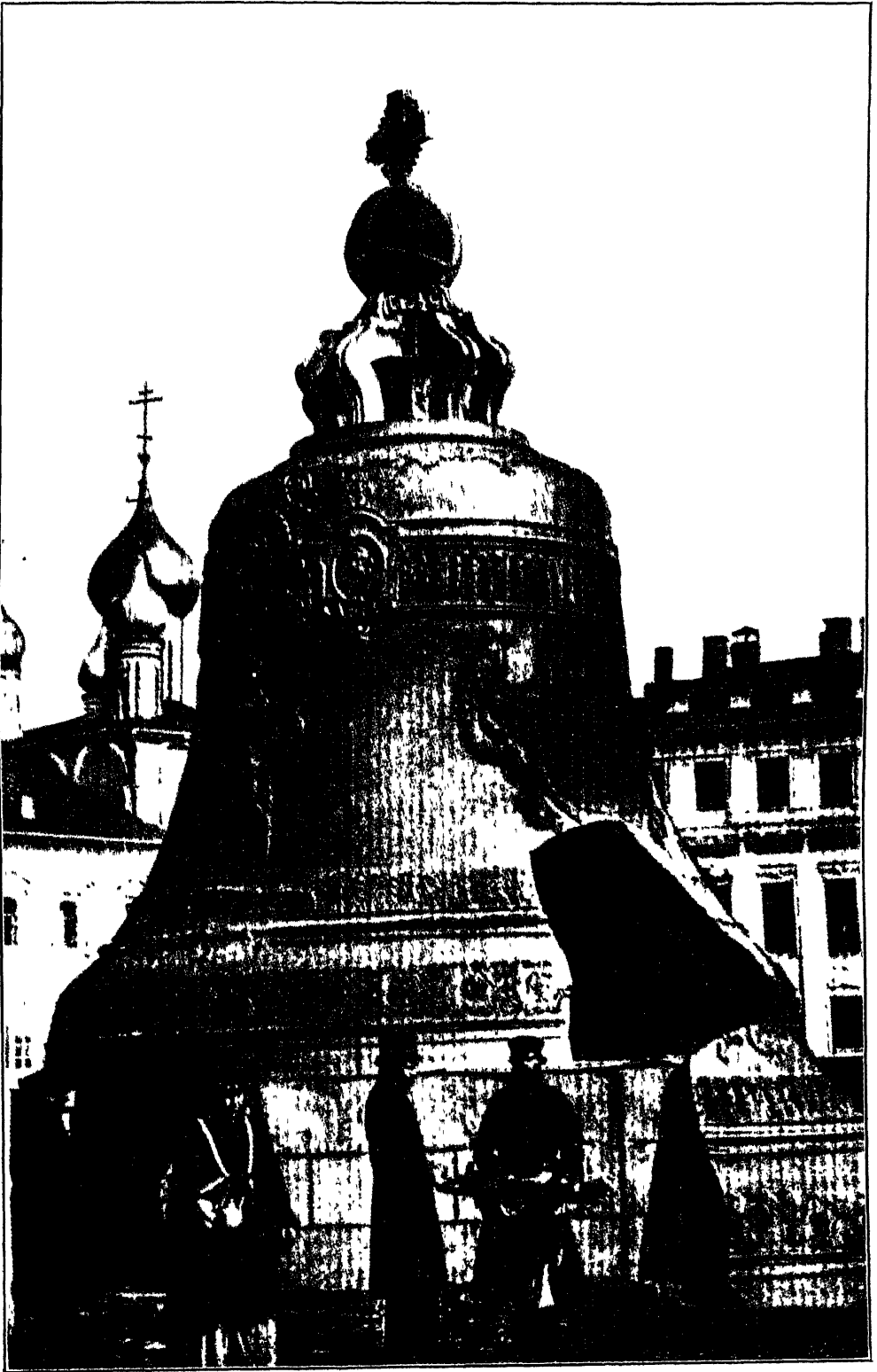
The imports and exports by countries are (1908):

COUNTRY	Imports (1,000 roubles)	Exports (1,000 roubles)
Germany	320,061	278,648
United Kingdom	121,043	220,059
United States	74,567	2,428
France	35,030	64,078
Austria-Hungary	25,070	48,819
Finland	28,783	48,725
China	14,692	
Italy	12,099	29,936
Netherlands	11,586	93,578
Egypt	13,767	3,638
East Indies	16,141	304
Norway	8,251	5,809
Belgium	8,121	34,359
Turkey	6,763	21,279
Denmark	9,187	31,385
Switzerland	4,324	
Sweden	10,261	4,678
Rumania		12,792
Spain		5,006
Other countries	21,300	32,155
Total	624,444	937,976

According to recent advices, the Russo-Mongolian trade is declining, at Urga, in comparison with 7 Russian firms, 100 Chinese trading-houses exist, and the town is changed to Chinese instead of a Mongolian trading centre; the Kalgan-Kiachta route as a transit commercial road has lost its value, and everything is being monopolized by the Chinese, trading in wares of all sorts except Russian; but this is apparently a purely commercial change without ill feeling on the part of the Chinese toward Russia or Russian trade.

Mining and Manufactures—According to official reports, 13,300 tons of copper were smelted in the first seven months of 1910, as compared with 9,752 tons in the same period of 1909. The soil of Russia is rich in ores of all kinds. In 1907 the production of gold, in kilogrammes, was 31,118; of silver, 2,141; of platinum, 5,301; of lead, 512, of zinc, 9,955 tons; of copper, 13,037 tons; of pig iron, 2,773,000 tons; of iron and steel, 2,364,000 tons; of coal, 24,537,000 tons; of naphtha, 7,675,000 tons; of

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THE GREAT BELL, MOSCOW.

salt, 1,836,000 tons. In 1909 the production of coal in European Russia was 24,080,045 tons. In 1909 there were 61,350,000 barrels of oil produced in the Baku district. There is an average production of coal in Asiatic Russia of about 40,000 tons. Most of the oil fields are in the Baku district, but oil is also found in the other districts of the Caucasus, in Transcaspia and in Turkestan.

In 1908 the number of all kinds of industrial establishments was 14,190, employing 1,723,177 wage-earners, of whom 435,684 were women and 184,396 children. There were 2,625 distilleries yielding 122,929,000 gallons of alcohol. The national drink of Russia is vodka. There is a very large number of cottage industries, most of which supply local needs. Lace-making, embroidery, wood-carving, and brass-work are among these industries.

About 20 per cent of the capital invested in Russian industries is estimated to belong to foreign companies.

Communications.—During 1908, 1909 and the first half of 1910 the Russian government decided upon the building of new railway lines aggregating 2,002 miles, at a cost of \$129,704,464. The railways open for traffic in 1909 comprised 44,595 miles, of which 34,108 miles were in European Russia. The Government operates 32,675 miles. The gross receipts in European Russia in 1907 were 710,783,000 roubles; in Asiatic Russia 78,623,000 roubles. The number of men employed on all railways was 825,315.

There were in 1907 126,238 miles of telegraph and 161,657,733 telegrams were carried, the post-office carried 967,930 letters and postcards.

The city of Moscow has municipal electric tramways, and new lines are under construction. In 1909 the profits were approximately \$1,000,000, and in the first 8 months of 1910 aggregated \$1,440,455.

The city of St. Petersburg is reported to have beaten the world's record in the installation of telephones for the period of one month. During Sept. 1910, 1,126 new telephones were installed. On 1 Nov. 1901 the telephone service was taken over by the municipality, and then numbered 4,200 telephones, there are now 29,500.

Social Conditions.—There are no comprehensive statistics regarding crime and pauperism. On 1 Jan. 1908 the prison population numbered 160,025. The system by which a considerable proportion of the convicts are sent to Siberia has been the subject of a great deal of discussion, but absolute statistics are not available. There seems to be every reason to believe, however, that the rigors of Siberian exile have been somewhat ameliorated of late years. It is certainly true, on the other hand, that many punishments are still inflicted in Russia which are condemned in other countries as barbarous. It is also true that the actual social system under which the villagers in large districts live is a sort of patriarchal despotism, the head of the village, or the head of the family, having very nearly absolute power over his dependents. This is one of the features of Russian life which are akin to the Oriental tradition.

The Russian peasant lives a very primitive life, and his *isba* or cottage has often but one room, warmed by a brick stove on top of which, in winter, the whole family sleeps. The usual winter garment of the peasant is a sheepskin

coat, made with the wool outward, and his usual fare is black bread and dried fish, with such variations as his intelligence and prosperity may secure. There are immense regions in Russia which are almost treeless, and others which are covered with pathless forests, the average number of villages is one to every four miles. The intense cold and long winters, moreover, add to the difficulty of maintaining any thickly settled population on the greater part of the area even of European Russia, while there are large districts in Asiatic Russia which are practically uninhabitable except by semi-savage, nomadic tribes.

On the other hand, in the cities, and in the university towns, civilization reaches a point of development quite equal to that of most European cities. A peculiar phase of Russian character is the incessant contradiction in the types developed. On the one hand we have a stolid, animal-like peasant, stubborn in his traditions and superstitions, and immutable in his rut, and on the other, the keenly intellectual student, fiery, emotional, brilliant, and skeptical oftentimes, passing in less than half a lifetime over ground which requires in other countries generations of gradual progress. In the villages, often, we find women treated like beasts of burden, and in the university towns they have the freedom of men. The aristocracy ranges in type from the most brutal and unintelligent conservative to sublime heights of ideality and self-sacrifice. At a stroke, without bloodshed, whole populations of serfs were freed; yet intellectual men and women have been treated, in Russian prisons, worse than the average nobleman ever thought of treating a serf. It is a country of contradictions, and the Russian nature seems often, to the puzzled observer, to be a blend of ice and fire, with the same strange fascination that Russian music has for the lover of the fantastic and unusual. There are many phases of Russian life which are ideally charming, quaint, and delightful, and they may exist side by side with much that is revolting, coarse, brutal, and archaic. Much of this contradictoriness explains itself when one considers the nature of the country,—a land without sea ports, where large cities with their own commercial and social life are set in the midst of huge thinly settled regions, and the enlightened land-owner—up to very recent years—had no more and no less power than the archaic type. Individualism runs riot in Russia, and at the same time, authority is more despotic than anywhere else in Europe. No country was ever a more perfect proof of the general truth that a nation is made by the land which it inhabits.

History, 1910.—Conditions in Russia in 1910 were anomalous. While there was plenty of evidence that cruelties had not ceased and the imprisoning and exiling of prisoners was carried on as ruthlessly as 20 years earlier when George Kennan apprised the civilized world of the state of affairs, in almost every other respect the country has gone forward. Economically it was never in better condition. In fact its economical changes are the most important and are causing a gradual change for the better in other respects.

Finance Minister Kokovtzeff announced in Oct. 1910, that the year's surplus over the estimated revenue would be \$103,000,000. He also

let it be known in France that Russia no longer needed its loans and succeeded in reducing the interest from 5 to $4\frac{1}{2}$ per cent. This condition was assisted by the fact that there was a good harvest. Stolypin's act in creating individual peasant freeholders to replace the ancient communal system of landholding has had the effect of rendering agricultural conditions more stable. Besides great tracts of virgin soil have been recently opened by settlers in Asiatic Russia, adding tremendously to the total of the year's crops. The "emigrants" who are settling this new land are in reality drafted from the overpopulated districts, a method which shows that Russia has not advanced except economically within the past few years.

Cholera ravaged the empire, and was caused by a barbaric lack of the most common sanitation. St. Petersburg, which suffered most, has long had a dangerously infected water supply, and all who can afford buy sealed bottles of spring water. The total deaths from the cholera epidemic in 1910 were 100,000 out of a population of 1,600,000. The plague which gained a foothold in Odessa remained to threaten a recurrence of the scourge throughout the winter of 1910-11. Largely on this account Russia decided to open its doors to foreign medical men, and it is to be expected that reasonable methods of sanitation will be adopted and the annual toll from filth diseases will be largely controlled.

Russia's wealth was indicated in the budget figures for 1911. The increased revenue amounted to a 10 per cent increase over the year before. The Government and the Duma have been able to agree readily on all questions of expense. The doubtful fund in the budget is labeled "free balance at the disposal of the State" and has at times been enormous. At the beginning of the Russian-Japanese war it was \$200,000,000, but five years later it was less than \$1,000,000. The bumper crops of the past year raised this to \$150,000,000, but only 3 per cent of it was needed by the administration. Extraordinary expenses were likely, however, to consume the remainder, especially in the building of the new Trans-Siberian railroad. An increase in revenue of \$55,000,000 was anticipated for 1911, the whole budget calling for \$1,415,000,000. The government monopolies all profited by the good year as well as the private concerns. The railroads made an additional \$25,000,000, the drink monopoly \$15,000,000, and the quasi-monopoly on sugar cleared an extra \$10,000,000.

One result of Russia's tremendous prosperity, which is even more likely than the old oppressions to lead to trouble, is the grip taken on the State by the trusts. There are practically no regulations for business combinations and those which have sprung up in Russia are mostly of the most malevolent character, formed primarily with the purpose of throttling competition and raising prices. No figures, compared with John D. Rockefeller and other trust magnates, have risen to the surface in Russia, primarily because the court dignitaries are in a position to cause trouble for anyone who shows himself too strong. Nevertheless their power is real and the oppression they have been able to exert over the poorer people has caused bitter attacks to be made upon them. They have not, however, been disturbed by

these, although Privy Councillor Miller has recently taken testimony to show the strength and extent of these trusts. The most powerful trust in all Europe is the Russian iron and steel combine with a capital of \$90,000,000. The operation of these trusts are conducted from Paris, as they are financed by French and Belgian bankers. The independent concerns have not been able to live beside the trust and one after another they have been taken into it. The trust had only one serious fight,—with the Polish iron works,—but a cut of 25 per cent in all prices forced the Polish ironmasters to surrender. High protective tariff is making the trust enormously wealthy. The supply has been cut down in order to raise prices and in one instance a flourishing iron works, employing 7,000 men, was closed down immediately after being absorbed into the trust.

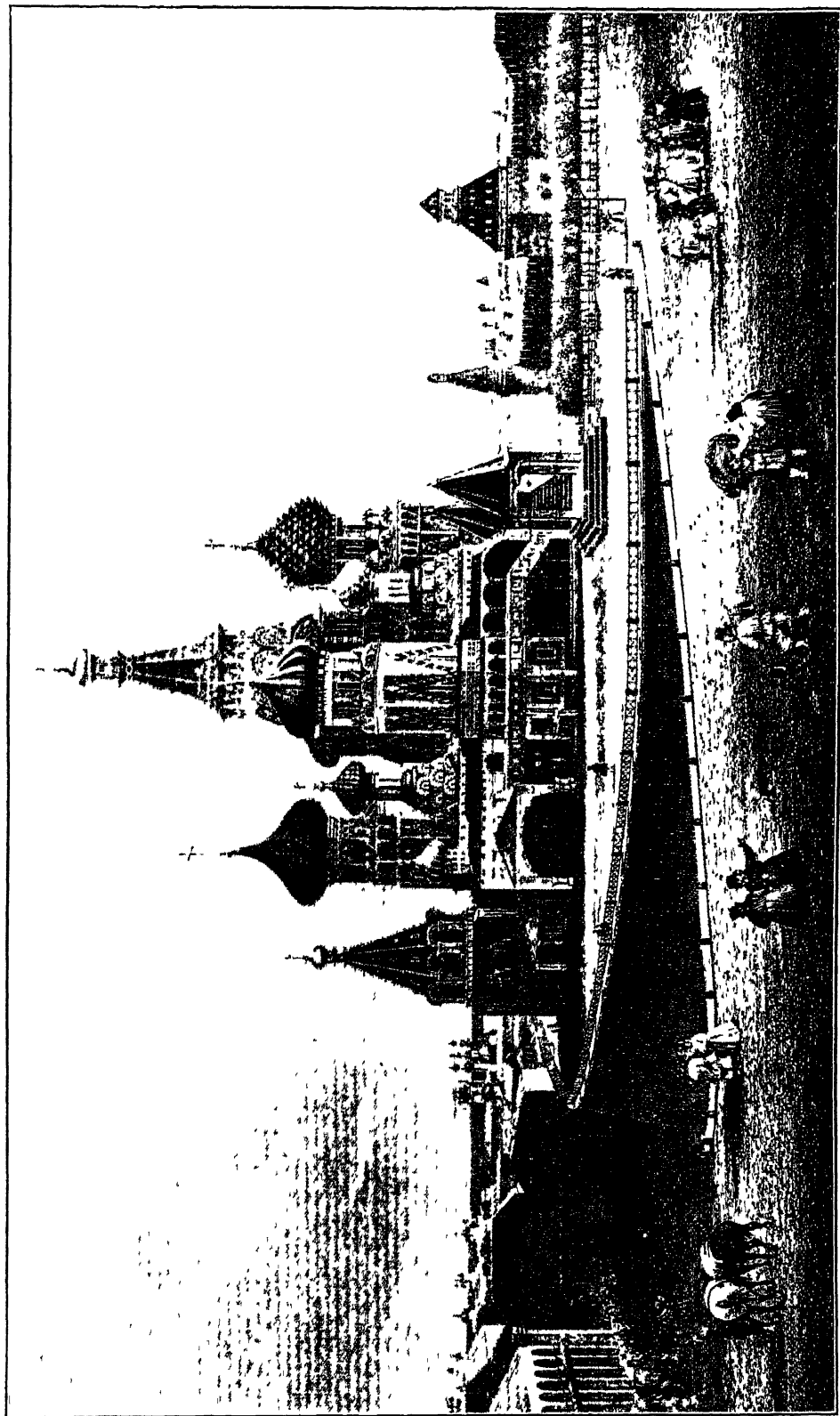
The coal trust had its inception during the political strikes which characterized the Russian revolution but its full strength was not shown until 1910. Several large railroads for their own interest fought the coal trust, but have now been forced to negotiate with it. There were signs of the coal trust losing its strength even at the height of its career on account of the subsidies paid mine owners for not mining. It suffered a loss on its working for the two years preceding 1 Jan 1911.

The Russian-American rubber trust controls the rubber market and has one factory the output of which is sold in every corner of the empire. During 1910 it raised prices from 15 to 30 per cent. In 1909 it made a profit of \$3,939,000, 44 per cent on its total capitalization. The steamship companies are also in a trust. The Caspian steamer trust doubled its petroleum freight rate in 1910 and all other freight rates have been increased on account of the formation of the trusts. There are also many local trusts which flourish chiefly on account of the slowness of freight. The salt trust of Odessa was able in 1910 to raise the price 50 per cent and maintain the business of the territory. The newly formed match trust lowered the prices of matches during 1910 to a point which was certain to drive its competitors out of business, and Russia has become sufficiently used to the trusts by this time to know that this will mean increased prices later. In some respects Russia is more in the power of the trusts than America and has the additional difficulty that there is practically no effort being made to curb them.

The big crops have prevented the activities of the trusts from being severely felt as yet except among the poorer classes, but it is predicted that there will be trouble within a few years, resulting in great economic strikes, a method of revolution at which the Russians have been very successful.

More interested in the gambling, adventurous side to an enterprise than its money making qualities, the project of forging a middle link in the chain of railroads from Calais to Bombay has taken hold of the Russian imagination and this will probably be constructed through Persia to British East India. This spirit among the Russians which led to the encroachments upon Manchuria has been stopped in that direction by the assistance given the Imperial Chinese Government by American and European bankers in financing a Manchurian railroad.

RUSSIA.



THE CATHEDRAL OF ST. BASIL, MOSCOW

RUSSIA

They had also contemplated building a railroad to the Adriatic, but this has been indefinitely postponed and the moneyed interests capable of financing a railroad have centred their attention on the Indian railroad. Complete freedom of action in Persia has been promised the Russians by the Shah and no national tax is to be applied to it. The railroad will be financed from Brussels, although accomplished largely by Russian enterprise and with Russian money. The length of the Persian section of the road from Ensels on the south Russian frontier to Nuschki, at the extreme northern end of the Indian system, will be 1,150 miles. Across Russia from the Austrian frontier, the line, 2,300 miles long, has already been built. The total distance from London to Bombay is 5,460 miles. Over the new line it will be possible to make the distance in six days.

To build this railroad requires imperial consent and the satisfying of high officials by a share in the project, but these preliminaries were evidently overcome during 1910 as the monarchist newspapers all spoke in favor of it, an indication in Russia of imperial consent.

The American engineer, John Hays Hammond, spent a fortnight in St. Petersburg at the end of 1910 arranging for the safe introduction of American capital into the Russian mines, and the building of grain elevators, etc., development work which American capital has been able to help in Mexico and Canada. Russia also has gigantic irrigation schemes worked out for the steppes and the districts opened in the trans-Caspian territory has made it advisable to secure experienced men from America to direct the work. The result of Hammond's conference will probably be the establishing of direct relations with large American interests and the opening of the Russian hinterland by American engineers.

An indication of Russia's commercial advancement is shown in the fact that there is a great demand for typewriters. During 1911 it was anticipated that at least 10,000 would be imported, 75 per cent of these of American make.

Prime Minister Stolypin returned to St. Petersburg from a trip into Siberia with a plan to build a new railroad into untouched territory, irrigate the whole region and populate it with "emigrants" from the poorer provinces of European Russia. But, as the cost would be \$100,000,000 and would be operated at a loss, Finance Minister Kokovtzeff vetoed it, although the rest of the cabinet favored it. The annual increase of 2,500,000 in the population was pointed out by Stolypin, but the project will not be carried out immediately.

Politically the chief difficulty in Russia during 1910 was in Finland where the bitter feeling has not died out. The Russian rulers have done nothing to mitigate it. They have been rigorous in their press censorship and have apparently hampered education as much as possible. In the Finnish budget, ratified by the Czar, many estimates for educational, economic, and sanitary purposes were cut out. Projects for the advancement of the district were all prevented, including a sanitarium for consumptives at Osterbothnia, a lunatic asylum at Uleaborg, a hospital in Helsingfors, new lecture rooms for the university, and the completion of roads in Lapland and the widening of the

Saima canal. But the governor's salary was increased by \$6,400 and \$10,600 has been added to the salaries of the senators in the economic department. A sum of \$21,500 was also set aside for press censorships, with a censor in each town. All the bureaucrats, who have been saddled upon Finland, have received additional pay, but sorely needed public movements have all been set aside. All documents issued by the chancellery of the Governor-General of Finland were also ordered to be issued in Russian, without a word of Swedish or Finnish.

The dismemberment of Poland has continued with the same deliberation that has characterized this movement from the first. In 1910 the provinces of Siedlitz and Lublin were annexed. This has long been favored by the reactionaries, but they have not been able to carry it out until it was made to appear to be necessary for the advantage of the Established Church. The consent of the Czar was thus obtained and the measure was forced upon the Duma. The history of the Church in this district indicates the situation. In 1875 flogging was used to make the people accept the Orthodox Church, and, when in 1905 they were permitted by the Czar to return to the faith of their fathers, he was so annoyed by the fact that they did so, that he punished the entire Polish nation. A whole new district is now to be compelled to submit to Russification, presenting a future probably more troublesome than Finland.

Within the Church there were rigorous reforms during 1910. The Monks, who lived like other European monks of the Middle Ages, were prohibited wine, tobacco, and choice foods and compelled to eat at the common table. This was found necessary in order to raise the tone of monastic institutions. Monastic reading has also been restricted to a few books of an ascetic character. The Holy Synod's figures show 421 male monasteries, containing 16,438 monks, and 391 female monasteries, containing 52,338 nuns.

A reaction in the treatment of the Jews took place during 1910. A year previously they had been permitted to go to the health resorts in the Caucasus, but those arriving there in May 1910, were ordered back by the local authorities. The same spirit spread over the entire empire and took active form in the fall. From 22 September to 6 October, 390 Jews were summarily expelled from Kiev, and at the same time 204 Jews were banished from Solomenka and Demieffka. But on 1 November, the Czar approved of a resolution adopted by the cabinet opening new sections for the residence of Jews. Previously legal residence had been restricted to that section of the Polish provinces and the Ukraine known as "the pale." Exceptions had been made for scholars and Jews in certain professions and trades, and many Jews became scattered throughout the empire, some without legal residence. These were the object of the attack during the summer. The imperial edict increases the "pale" to include sections of the provinces of Vitebsk, Valhynia, Mohilev, Poltava, Kherson, and the town of Yekaterinodar, the capital of Kuban. The sections affected had already been occupied by Jews.

When the Duma met, 4 Nov. 1910, it was obvious that its activities would be chiefly in the minor regulation of the great reforms which

RUSSIAN ORTHODOX CHURCH — SAFETY

are changing conditions in the Russian Empire. Chief of these is unquestionably the change in the method of land holding, a region the size of England having been already worked by the new freeholders. The Agrarian Settlement act had been in operation only 26 months at that time. Within half a dozen years it was predicted in Russia that production from the land would be increased to a point by this method which would revolutionize the food supply of the world. With one-sixth of the earth under Russian control, this is not at all unlikely. The Duma was split into its usual parties, from extreme reactionary to violent socialists, which had the effect of making its deliberations largely useless, no working basis being possible.

The Czar paid a visit to Germany late in the fall of 1910 to which considerable political importance was attached. He was entertained by the Kaiser and the two men were on a footing of friendship which smoothed over the strained political situation early in the year. Both at home and abroad the Czar showed a desire to get on a footing of popularity and there is no question but that his increasingly democratic ways have won for him a better position with Russians in general.

A drastic order was issued from St. Petersburg prohibiting German immigration into Russia. For more than a generation there had been a steady flow of German families into the three western frontier provinces, Kief, Volhynia, and Podolia. Twelve per cent of the agricultural land had fallen into their hands and they had become Russian citizens. The order forbade anyone owning land in this region unless born of orthodox Russians who were orthodox Russians at the time of their marriage. The effect of this was to disturb the land titles of over 2,000,000 people. The law was passed as a retaliation against Germany for encouraging its immigrants to Russia to become Russians while retaining all the rights as Germans.

To protect St. Petersburg from attack and make the Gulf of Finland impassable in time of war, two great forts have been ordered by the Imperial Government. One will be in the sea near Reval, containing 170 guns, 20 of them 12-inch guns, mounted in turrets, and the other

will be on an island in the Finnish archipelago. The two forts will cost \$50,000,000.

Sazonoff, the assassin of M. Plehve, the Minister of the Interior, died in Zarantus prison, 12 Dec. 1910, after four years' confinement. It was not known whether he died from flogging or committed suicide. Punishment is so severe in that prison that suicide is common.

Professor Korolenko, who collected figures on the deaths following court martials, affirmed in an article which was later confiscated that 80 per cent of the men and women who were condemned by court martial since the revolution died innocent. He showed that death usually followed the court martial immediately and no time was given for appeal. The editors of the papers who published Korolenko's revelations were thrown into jail.

Russian Orthodox Church. See GREEK CHURCH.

Ryan Monument. The fund for a monument to the Rev. Abram J. Ryan, "the poet-priest of the South," has been completed. The amount was raised by popular subscription, the idea being to collect the money in small amounts. Most of it came in dimes and the projectors of the monument were much pleased at the success of the movement. The *Mobile (Ala.) Register* said that \$2,500 was collected and that this sum, "taken in connection with the valuable designs for a monument and the fine heroic size plaster bust of the poet donated to the use of the builders, is ample for the erection of a handsome monument, a fitting memorial of the beloved patriot."

Rye. The rye crop in the United States ranks eleventh in point of value among the crops of the country, the 32,088,000 bushels produced during the year being worth at the farm about \$23,000,000. This crop is constant in production and during the year 1910 varied little in value from recent years. A larger share of the national crop is now produced in the North Atlantic States than was in 1889, the increase being from 28.4 to 33.9 per cent in that section. During the same time the North Central States have declined in their share of production of the rye crop from 63.2 to 57 per cent.

SAFETY, American Museum of. The exhibit of the American Museum of Safety, which was opened on 21 Nov. 1910, in the Engineering Societies' building, New York City, was made permanent and is to provide a national clearing-house for safety devices, to give manufacturers and others an opportunity to get the latest information concerning safety appliances. A collection has been made covering the whole field and photographs of the devices in actual operation have been taken.

With the idea of safety as a basis the museum has decided to cover the whole field of human life and act for its conservation. A division is devoted to sanitation and another to means for lessening noise, etc.

At the opening of the exhibition the *Scientific American* gold medal was presented to the Patent Scaffolding Company of New York for manufacturing and placing on exhibition the best perfected and practical device for conserving human life and limb in the processes of

productive industry. The patent scaffolding won the medal on its showing of life saved. In five years in New York City alone 660 men were killed by falls from high buildings, and 177 were killed by falls from scaffolds. But during the two years that the patent scaffolding had been in use previous to the awarding of the medal it had been used in the erection of 319 buildings without injury to any of the workmen. The total number of scaffolding units was 8,265.

The scaffold is divided into 10-foot sections, and at the ends of each section are winches securely fastened to the horizontal iron beam which supports the planks. At each winch is a drum about which the wire rope coils, the upper end being fastened to an outrigger at the top of the buildings. Ratchet wheels secure the drums, and a pawl, actuated by a lever, lowers or raises the scaffold by means of the ratchets. One man on a section can move it, making him independent of other workmen,

expediting the work and, at the same time, not adding to the danger.

The medal of the Travellers' Insurance Company was awarded to the United States Steel Corporation as the American corporation which, in the judgment of the museum, had done the most for the protection of the life and limbs of workmen by means of safety appliances for machines and processes.

The National Tube Company of Pittsburg sent a complete exhibit to the museum, showing how it guided its workmen. Many other companies have similar departments devoted to safety work of this character, but only a few had exhibits. One of the devices of the National Tube Company was a little danger sign which only showed when danger was imminent. The reason for this type of sign is that workmen are likely to disregard danger signs. A similar device for railroad uses is a red signal target which is to be sprung upon the rail of a track down which danger lies. This is of particular value for switching purposes, the car receiving a jolt which warns the brakeman of the danger, even if he does not see the signal. Another railroad safety device exhibited was a slip of sheet iron which is placed in the frogs of a switch to prevent a shoe from catching.

Another common cause of industrial accidents is the turning of steam into boilers when a boiler cleaner is on the inside. In big factories where, on account of the noise, the boiler cleaner may not be heard, and this accident is most likely to occur, the steam is turned on by a steel wheel a foot or more across. The device is simple. The cleaner before entering the boiler places over the wheel a flat, round box and padlocks it. Putting the key in his pocket he is in perfect safety until he has finished.

In foundries men frequently scorch their hands and arms and to prevent it usually use gloves and waste, but the new invention to protect them is an arrangement like a stove lid lifter, which does the work.

Life preservers made of balsa, a wood lighter than cork, are on exhibition. They are highly polished to prevent waterlogging and are not covered with canvas which gathers moisture and helps the life preserver to deteriorate. The specific gravity of the new life preservers is .16, as compared with cork which is .24. A new davit for lifeboats, invented by Captain Welin of the White Star line, is shown to be capable of lowering a boat overside in 2 minutes without danger of jarring, and releases the boat at the right moment without hazard of fouling the tackle. Collapsible lifeboats of canvas, floated by Kapok, a fibre which does not swell in water, are also exhibited.

Many simple arrangements are shown by the museum to prevent accidents. The workmen who swing large steel hooks at the end of a derrick chain often bruise and crush their hands in slipping the bolt into the loop of chain or eye ring against which it is to lift. All that is necessary is a handle on the outside of the hooks. Emery wheels, which frequently burst, are provided with steel hoods to protect workmen, and wide steel flanges to hold them together and prevent them from flying broadcast. Another simple device on exhibition is a burlap screen placed opposite men who are chiselling into steel. The burlap catches the

chips and prevents them from rebounding into the workman's eyes.

A frequent cause of asphyxiation is an improperly closed gas cock. The device which compels the unlocking of a safety catch by a firm grasp on the cock obviates this danger. In closing, the safety device snaps loudly, indicating that it is locked. There are on exhibition also theatre doors which will open automatically when a heavy weight, such as a mob of people, pushes against it; safety gasoline cans containing a fine gauze; automatic street car fenders which drop to the track when anyone strikes them, testers which can be placed on the side of a machine and indicate the presence of broken bolts and loose bearings; oxygen helmets for workmen in chemical factories; and a house built of asbestos and steel, which is absolutely indestructible and fireproof.

Sage Foundation. See RUSSELL SAGE FOUNDATION.

Sage, Margaret Elizabeth Slocum. American philanthropist b. Syracuse, N. Y., 8 Sept. 1828. Her education was received in the public schools of Syracuse and the Troy Female Seminary. From the New York University she received the honorary degree of Mistress of Letters in 1904. In 1869 she married Russell Sage, Watervliet, N. Y., and since his death, in 1906, has devoted herself to the careful distribution of the vast fortune left to her. Among other large benefactions may be mentioned gifts of \$1,000,000 to Emma Willard Seminary, Troy, N. Y., \$1,000,000 to Rensselaer Polytechnic Institute; \$350,000 to the New York Y. M. C. A., \$3,000,000 to the Sage Institute of Pathology; \$250,000 to a home for indigent women; and \$10,000,000 as "The Sage Foundation" for social betterment.

Saint Kits. See LEEWARD ISLANDS

St. Andrew, Brotherhood of. See BROTHERHOOD OF ST. ANDREW.

St. Helena. An island in the Atlantic Ocean, of beautiful climate, of volcanic construction, of geographical importance, and belonging to Great Britain. The island is more than 1,200 miles from the African coast, the area is about 47 square miles, the population in 1908 numbered 3,550. St. Helena, now under the administration of a British Governor, was discovered in the beginning of the 16th century. It was colonized by the Dutch in about 1645; taken by the British East India Company a few years later; recaptured by the Dutch, and once more and finally seized by the British Company. It has been an island of ostracism for dangerous enemies of Britain; Napoleon and Cronje, the Boer, notably. The Government supports the work of education in nine schools with 665 pupils, grant, \$3,200. Roman Catholic, Church of England, and Baptist church buildings exist in the island. The receipts of the Government in 1909 amounted to \$42,800, and the expenditure to about \$40,600. There is no debt. Savings bank deposits in 1908 amounted to about \$85,500. There is cable connection with the Cape. The agricultural resources are fair. Fruit trees and other trees thrive; potatoes are grown. Flax, in considerable quantities, is raised; the exportation of the article in 1908 weighed 128 tons, besides 40 tons of tow. There is some live stock, but meat is not exported.

ST. LOUIS, MO.—ST. VINCENT

The total value of the imports into Helena in 1909 was \$142,850, and that of the exports from the colony, \$38,450. Lace-goods are included in the exports. About 150,500 tons of shipping—all representing British trade—entered and left the "port" in 1908. Jamestown claims almost half the inhabitants of the island. St. James Bay is the most accessible point of entry to the fortress, which, since the construction of the Suez Canal, has lost much of its value as a port of call, and which is now scarcely more than a congenial visiting-place.

There were indications during 1910 that the island of St. Helena, off the west coast of Africa, the exile home of Napoleon, would lose its importance except as a strategical point in British navy maneuvers. In that respect even no advantage is taken of the island at present. The difficulty arose from the fact that the regiment of troops which was formerly always quartered on the island was withdrawn in 1906, and, as they contributed largely to the support of the island, it has since been reduced to a state of penury. The expenditure, which before 1906 was a third less than the revenue, by 1910 had become a third more, while the exports had sunk below the imports to an even greater degree. A movement was set afoot in England to make the island a stopping place on the way to the Panama Canal, as it was formerly in the Cape of Good Hope journey to India. At that time as many as 100 vessels were often in the harbor at once. But with the gradual passing of sailing vessels the steamers do not need to stop for provisions and the economical need of St. Helena for this purpose is doubted. At present it is only inadequately fortified. The dock facilities are also very scanty. The last important use made of St. Helena was during the Boer War when it was utilized as a military prison.

St. Louis, Mo. According to the census of 1910, St. Louis has a population of 687,029, a gain of 19.4 per cent over 1900. It is now the 4th city of the Union. St. Louis has 922 2-3 miles of streets, of which 591 are paved. The annual death rate is 14.61, and the birth rate, 20.68. The assessed value of the real estate is \$460,390,500, and the personalty, \$105,729,530. The tax rate is 22.20 per 1,000. St. Louis has a public debt of \$27,815,311. The annual cost of the city government is \$11,268,301, or 16.41 per capita. Of this sum, \$2,912,524 is expended for schools whose pupils number 87,931 and principals and teachers, 2,256, \$878,587 for the fire department of 778 men, and \$2,100,996 for the police force of 1,626 members, whose annual arrests average 38,128. The city owns the water works, they cost \$20,000,000. There are 885 miles of mains and the average daily consumption is 75,426,000 gallons. The total daily capacity is 180,000,000 gallons. The city spends annually \$147,062 for electric light, which is furnished by public service corporations. There are 651 miles of sewers. The annual cost of the street cleaning department is \$652,233.

St. Lucia. One of the Windward Islands in the West Indies, under British Government. The area is about 230 square miles (St. Lucia being the largest of the Windward group), and the population in 1909 was estimated at about 55,850. The island is at present under British administration, but it is a hot-bed of Franco-

English dissatisfaction, and if true to its past record in future, may soon be French territory. There is an Administrator and Colonial Secretary, receiving a salary of \$6,500. There are a Chief Justice, an Attorney-General, and a Treasurer. The revenue for 1909-10 amounted to \$320,500, and the expenditure to \$314,200. The debt in 1910 was about \$726,500. Education is dispensed in sectarian schools, grant, about \$2,250. The island is forest-covered, the vegetation is rich. The leading products and exports are sugar (5,360 tons exported in 1909), spirits, 27,880 gallons exported, cocoa, 2,170,000 pounds exported. The imports into St. Lucia in 1909-10 were valued at \$1,298,350, and the exports from the colony at \$1,222,550. About 650 steamers carried the paramount trade in 1909. Port Castries is a splendid coaling station. The town has more than 8,000 inhabitants. The savings banks in 1908 had deposits amounting to about \$95,000.

St. Pierre and Miquelon. French Islands in the Atlantic not far from the Newfoundland coast. The area of the smaller (St. Pierre) and its associate islands, is about 10 square miles; and of Miquelon, 83 square miles. The population is about 5,000. The chief town is St. Pierre, which is visited by vessels bound to and from Europe, Canada, and the United States. The colony is presided over by an Administrator, who is seconded in the administration by a chief council and local councils. The revenue for 1908 amounted to about \$93,150, counterbalanced by the expenditure. French subvention, \$41,500. In the beginning of 1907 the debt was \$95,500. Private boarding schools in the islands are attended by about 350 pupils; "kindergarten" schools by 135 pupils, and the six public schools of the colony, which employ 19 teachers, by about 500 pupils. Elementary education is gratuitous. Cod fishing is the principal occupation of the inhabitants, who may not engage in agriculture on those sterile rocks. More than 40 snacks were in the business in 1909. The principal imports comprise beverages, food produce, cloth, and clothing. The exports are fish, which are nearly all cod. Imports in 1908 amounted to the value of \$1,022,300, and exports to about \$1,285,800. In 1908, 1,875 vessels entered the ports, registering about 110,500 tons.

St. Vincent. An island in the British West Indies, with an area of approximately 140 square miles, and a population of 53,450. There are considerable numbers of Portuguese among the inhabitants—a thrifty class. Kingstown is the capital of the colony, and a town of about 4,500 inhabitants. The government consists of an Administrator, assisted by a Legislative Council of seven members (three unofficial). The revenue for 1909-10 amounted to about \$142,000, and the expenditure to \$155,000. The Government assists the work of public instruction, which is carried on in 27 primary schools, the grant amounts to about \$7,000. Justice is administered in a Supreme Court and in lesser tribunals. The Government has recently undertaken the dispensation of Crown lands, and the peasants are being encouraged in the work of agriculture. About 13,000 acres are under cultivation. The forests produce good timber. Agricultural products are: sugar, cotton, cocoa, spices, and arrowroot. Rum is distilled. Molasses

SAKAKAWEA STATUE — SALVADOR

ses is prepared. The leading articles of import are linens, cottons, woollens, flour, fish, and other foodstuffs. Most of the products are exports. Total imports in 1909-10 reached the value of about \$435,000, and the exports, the value of \$405,000. There is a telephone system, length of line about 75 miles. The postal service is adequate.

Sakakawea Statue. Five Indians in their native dress, delegates of tribes now living in North Dakota — Sioux, Shoshone, Arickara, and Grosventre — were present at the unveiling at Bismarck, N. D., in December of the statue of Sakakawea, the "Bird woman," who acted as guide for the Lewis and Clark explorers when they made their trip to the Pacific coast. James Holding Eagle and Black Cloud, two of the delegates, said, when asked about Sakakawea, that they had no recollection of hearing their relative talk of her until after the movement for a monument was started. Holding Eagle stated that when Sakakawea died she was taken back to her old Shoshone home in Western Montana for burial. Nothing is known of what became of the child she carried on her back on the trip to the Pacific coast and return, nor of her other children. The other three Indians were Crow Ghost, an Arickara and typical redskin of the old days, Mattie Johnson, a Shoshone and of the same tribe as Sakakawea, and Peter H. Beauchamp, another Arickara and one of the most successful farmers on the Berthold reservation.

Sakhalin (otherwise known as Karafuto) That part of the island (which lies in the China Sea) south of 50° N. Lat is under the administration of the Japanese, and is the important portion of the territory. There is a military governor in control of the government. The area of Sakhalin is estimated at 12,500 square miles. The population is about 18,000. The revenue and expenditure amounted, in 1909-10, to approximately \$315,000, and the Japanese appropriation to about \$635,000, counterbalanced by the expenditure. Among the resources of the colony are the forests of fir, and the deposits of coal and gold. The principal industry, however, is herring fishing. The soil is productive, and with an influx of Japanese colonists, now begun, agriculture may become very successful and the trade profitable to the congested empire of Japan.

Salesmanship, School of. The proceedings of the meeting in Boston of the National Association for the Promotion of Industrial Education show that the firms of five co-operating department stores in Boston deem it worth while to send the girls they employ to the Union School of Salesmanship, which is conducted by the Women's Educational and Industrial Union. Besides sending the girls to the school, the firms pay them full wages during the three months' course of morning sessions. The pupils report for work in the stores at 1230 each day, after the morning lectures by representatives of the firm, discussions of experience, and demonstrations of selling particular classes of goods. The "one-price" system, with a policy of exchanging goods and making up deficiencies, has done away with the need of teaching pupils to bargain with their customers. But they are taught instead a very efficient personal service.

Salvador. A Central American Republic, westward in the country, and with a coast-line more than 40 miles in length.

Area and Population.—The area is about 7,225 square miles. The population in 1910 was 1,707,000, making Salvador the most densely populated country in the Western Hemisphere. The government seat is San Salvador, with a population of about 60,000. Santa Ana has 49,000 inhabitants, San Miguel, 24,750; Nueva San Salvador, 18,800; Sansonate, 17,000; and San Vicente, 17,800.

Government and Finance.—The President of Salvador is assisted by a Vice-President and four ministers, viz of Finance, etc., of the Interior and Government, of War and Marine, and of the Exterior. The President holds office for four years. Under the constitution of 1824 (which has been frequently modified), Congress is made the legislative power. Deputies number 70, more than half of whom are land owners or property owners. The Republic has been such since the dissolution of the Central American Federation, 1839. The revenue for 1909 amounted to about \$4,234,500, and the expenditure to \$4,435,350. The internal debt in 1909 was \$3,468,800, and the external, about \$4,625,400. The principal sources of revenue are taxes on imports and exports, on liquor, excise, stamps, and the postoffice. The public debt, war, and the interior are the chief items of expenditure.

Education and Justice.—Education is promulgated in normal and technical schools (six in number), in 20 secondary schools, in several special schools for instruction in medicine, etc., and in 600 schools of elementary instruction. The last-named have a total enrollment of about 30,000 pupils. Education in Salvador is gratuitous and obligatory. The Supreme Court, subordinate courts, and those of local jurisdiction, are the tribunals of justice in the Republic.

Products and Industries.—The principal occupation of the country is agriculture. Attention is being turned to the cultivation of wheat and cotton. The chief article of production is coffee. About 225,000 acres are devoted to its culture. Indigo, balsam, and sugar are produced in large quantities. Minerals consist of gold, silver, copper, iron, and mercury. The mining industry is increasing. United States companies operate in the mine-fields of Salvador.

Commerce and Shipping.—The leading imports into the Republic are cotton goods, drugs, hardware, flour, and silk goods. The chief exports for 1908 were about as follows. Coffee, \$10,398,500; indigo, \$525,400; balsam, 206,600; sugar, \$669,500; and minerals, \$3,295,500. The value of the imports for 1908 was about \$4,240,500, and of the exports about \$15,433,800. (Figures computed according to the "nominal" value of the Salvador "dollar." The "actual" value of the silver "dollar" or "peso" is about 40 cents U. S.). The imports for 1909 amounted, nominally, to \$14,339,350, and the exports to \$18,131,450. A great deal of the country's trade goes to and comes from the United States. Germany and France are next in order of commerce, although there is a "most favored nation" agreement with Great Britain (since 1862). About 350 steamers entered and cleared at the ports of Salvador in 1905.

Roads, Railways, Telegraphs, Etc.—There are more than 2,000 miles of good highway in

SALVATION ARMY — SAMOS

the country. Railway lines operate between Santa Ana, La Ceiba, and Acajula; between the capital and Santa Tecla; and a line connects San Salvador with the Santa Ana line. Total length of line, about 100 miles. Telegraph offices numbered 200 in 1909, with 2,479 miles of wire; despatches, 1,039,775. Telephone line extends 2,049 miles, and is operated through 137 offices. There were over 80 postoffices in 1909. There are three important banks in Salvador, viz the Bank of Salvador, capital about \$1,250,000 (actual); the Occidental Bank, \$250,000, and the Commercial and Agricultural Bank, \$369,000.

History, 1910.—In the vicinity of San Salvador a tuberculosis sanitarium has recently been established, in which the open-air treatment will be employed. The expenses will be borne from appropriations by the federal and municipal governments, contributions of industrial companies and private donations. One of the improvements made during 1909 was the construction of the avenue of Santa Tecla uniting the latter place, which is known as the "City of Flowers" with the suburbs of the capital. A new national theatre is one of the more important undertakings to be carried out in the near future. Dr. Manuel E. Araujo is the unanimous choice of Salvador for the next President, to succeed Gen. Fernando Figueroa, who is one of his strongest supporters. Doctor Araujo is one of the best known physicians and surgeons in Latin-America and has invented several scientific instruments. He is also one of the wealthiest men of Central America, and it is expected that his administration will attract foreign capital to the country.

Salvation Army. An aggressive semi-military Christian organization, started in London by William Booth, a preacher of the Methodist New Connection, in 1865, with branches in nearly all parts of the world; the work in the United States began in 1880. The Army in the United States, according to recent reports, has 886 corps and outposts; indoor attendance at meetings, 9,392,491, open-air meetings, 1,613,002; local officers and bandmen, 5,494; junior meetings held, 55,422; attendance at junior meetings, 1,580,522; industrial homes, 107; men admitted to industrial homes, 12,104; workingmen's hotels with shelter accommodations, 79, with accommodations for 7,704, for which a fee of 15 to 30 cents is charged each applicant, according to the privileges; slum posts, 23, reporting 2,130 cases of sickness; families visited during the year 1909, 27,761; rescue homes, 26, to which were admitted 1,533 women and 1,042 children; missing friends found through bureaus, 206; three land colonies, including 2,569 acres, with 399 occupants. The Army distributed about 20,000 Thanksgiving dinners and nearly 400,000 Christmas dinners in 1910, through the generosity of the public at large, who furnished more than enough to pay for the same. Temporary relief was afforded to persons outside of its other self-supporting institutions to 173,056 during the year 1909. At the summer outings 4,751 mothers and 35,949 children participated. The Salvage department is a large means of revenue to the Army. The goods are gathered from the homes of the well-to-do and fixed up and sold either to the second-hand stores, or direct to the poor at "rummage sales." The Army employs a large number of men

and women to collect money and other gifts from house to house, and in stores and offices.

Samoa. United States Samoa consists of the island of Tutuila and other small islands in the Samoan group, Pacific Ocean. The total area is about 80 square miles, and the population approximately 6,650. United States dominion was established in Samoa in 1900. The island of Tutuila had been jointly supervised by Germany, Great Britain, and United States, and eventually had been neutral, before the latter country perfected an arrangement with the two powers for control of the colony. The Governor is appointed by the President, and he appoints officials to carry out the local administration, as far in harmony with native customs as possible. There are three administrative divisions, viz: the Eastern and Western Tutuila, and Manua Districts. Over all of these there are native "governors" assisted by native minor-officials, such as high chiefs and village chiefs. There are courts of superior and inferior jurisdiction. Missions representing Roman Catholicism, Wesleyanism, and Mormonism, (four in number), conduct the propagation of Christianity. There are denominational schools, and three non-sectarian. The Government supports one of the latter, and the other two are maintained by the natives. Total number of educational establishments, 37; pupils about 1,440. Tutuila, which is the most beautiful of the Samoan Islands, is mountainous, but luxuriant in vegetation, and the soil is very fertile. Bananas, cocoanuts, yams, and breadfruit are grown. Taro and copra are chief among the products. The annual output of copra amounts to about 2,000,000 pounds. The natives usually pay their taxes in the article. Imports into Samoa in 1908 were valued at \$75,000, and the exports at about \$86,000. The principal trade passes in and out of the harbor of Pago Pago—the best harbor in the islands. Vessels entered at that port (which is a United States naval station) in 1908, registered 22,000 tons.

Samos. An island in the Ægean Sea, mythologically conspicuous and with a Grecian history, virtually under Turkish control, but nominally independent, by virtue of a tri-national political supervision. The area is about 180 square miles, and the population in excess of 53,400. Foreigners number approximately 1,350. The government seat is Vathy, with about 25,000 inhabitants. The revenue for 1908 amounted, as estimated, to about \$185,800, and the expenditure to \$183,200. The public debt was about \$128,500. The products of Samos are chiefly tobacco, olive oil, wine, and the following minerals: silver-lead manganese, antimony, copper, zinc, and marble. The minerals are, practically, unworked. Raisins and carob beans are grown. Leather curing and cigarette manufacturing are among the best industries. The imports amounted, in 1908, to about \$1,315,100, and the exports were valued at approximately \$1,238,700. The leading articles of export are wine, raisins, leather, oil, cigarettes, spirits, etc. The capital has a good harbor. Vessels entered in 1908, about 4,250, registering 464,135 tons. The trade represented was chiefly Austrian, Turkish, and French. Britain supplies about one-quarter of the country's imports. There are telegraphic and postal communication; despatches over the wire in 1908, 14,230; postal missives handled, about 102,300.

SAND-FLY FEVER—SARGOSSA SEA

Sand-fly Fever. It is now believed that there is a distinct and new disease, requiring special treatment, which may be called the sand-fly disease or fever. It lasts about three days and is not fatal, though a week's convalescence is generally required, and occasionally certain sequelæ result, which are most unpleasant. Dr. T. G. Wakeling, in a recent article in the *British Medical Journal*, says:

"The symptoms are local and general. The bite is followed by intense itching and irritation, which persists, and is followed by the formation of a raised lump with a small, watery head, and with a surrounding zone of inflammation. As the flies bite at night, sleep may be prevented for some hours.

"The illness begins with a feeling of tiredness, loss of appetite, malaise, headache, aching in the limbs, disinclination to do things, rigors are uncommon, vomiting takes place sometimes. The temperature rises sharply to 101 or 104°F. (less in recurrent attacks). There is a disordered digestion, the hands and feet are hot, the pulse is bounding and increased in rapidity. Blood pressure is probably raised from the beginning. Later, there is a well marked anemia and rapid loss of weight.

"The micro-organism is probably not got rid of easily, and months after an attack, chill or exposure or wet may bring on another attack of fever,—accompanied by effusion into synovial or pleural cavities, or neuritis. The incubation period is about four days."

Three days fever in cattle is well known in Egypt, and it is possible that the disease may be conveyed from them to human beings, as the flies are found in large numbers in the vicinities of the dwellings and stables. The fly is said to be called by the natives 'akhl-uskut,'—silent eater. This is hardly true, as the fly makes a high pitched noise, similar to that of the *Culex* mosquito, only of much higher pitch. The fly is light brown in color, so small that it can pass through the meshes of a mosquito curtain. It is found in Egypt, Austria, Malta, and Italy. Its technical name is the *phlebotomus papatasi*.

San Domingo. See DOMINICAN REPUBLIC.

San Francisco, Cal. According to the census of 1910, the city has a population of 416,912, a gain of 21.6 per cent over 1900. San Francisco is now the 11th city in the Union. It has an area of 46½ square miles, with 825 miles of streets, of which 327 are paved. The annual death rate is 13.56 and the birth rate 14.67. The total assessed value of the real estate is \$432,863,393, and the personalty \$81,139,212. The tax rate is \$20 per 1,000. San Francisco has a net public debt of \$15,812,767. The annual cost of the city government is \$11,123,500 and 26.68 per capita. Of this sum, \$1,747,963 is spent annually on schools, whose pupils number 50,212, and teachers and principals 1,222; \$1,262,432 on a fire department, composed of 768 men, and \$1,335,798 for the police who number 892. The water works are owned by a private corporation. They cost \$45,500,000. There are 458 miles of mains and the average daily consumption of water is 35,000,000 gallons. This is the total capacity of the works. The city spends annually \$208,000 for electric light and \$167,000 for gas. There are 449 miles of sewers. Many radical amendments to the city charter were adopted at the election held 17

Nov 1910. Some of them are the initiative and referendum, the submission to popular vote of all the requests for public utility franchises and renewals, a provision for the printing on the ballot, opposite the name of each candidate, a 100-word statement of his platform, the elimination of the party circle at the head of the ballot, the rotation of the names of the candidate, the establishment of a free public agency for labor, and a minimum wage scale of \$3 a day and 8 hours to constitute a day's work. The State of California has adopted an amendment giving \$5,000,000 for the Pan-American-Pacific Exposition, which is to be held in San Francisco in 1915.

San Marino. An independent Republic in the northeastern portion of Italy, on the Adriatic, and near Rimini. The area is about 33 square miles, and the population, 11,000. The capital is San Marino, with 1,500 inhabitants, and there are four small towns. The government, the form of which has been virtually unaltered for 1,000 years, is administered by a Great Council of 60 members, one-third of whom are nobles; one-third townsmen, and one-third peasants. Two members of the council are elected as regents for six months (April and October), and are not then eligible for office until the expiration of three years. The leading articles of trade are wine, cattle, and stone. Agriculture is quite successful, as is viticulture. Besides the palace, at the capital, there is a splendid church and a theatre. The town San Marino is fortified by nature. It was founded in the 5th century, and is noted for having been recognized by Bonaparte and Garibaldi, in its independence, and as a savior in time of extremity.

Sao Thome and Principe. See PORTUGUESE EAST AFRICA.

Sarawak. A province of British North Borneo, about 52,000 square miles in extent, and with a population of approximately 500,000. Kuching, on the Sarawak River, is the chief town. A Rajah is in immediate control of the administration. The revenue for 1907 amounted to about \$819,700, and the expenditure to \$773,700. Chief sources of revenue are opium, gambling, and pawn farms; taxes, and commercial duties. Christianity and education are represented by the missions and mission-schools of Roman Catholics and Episcopalians. The postoffice has 23 branches. The government has a telephone system, extending to northern Sarawak. The natural resources of the country comprise minerals, such as gold, silver, antimony, and mercury. Precious stones are found, Sago, pepper, gambier, and other similar products are exported. Total exports for 1908 were valued at about \$3,820,500; sago reaching the value of about \$585,000; and pepper the value of \$815,000. The imports consist chiefly of tobacco, salt, kerosene oil, liquors, etc., and amounted, in 1908, to the value of about \$2,541,200. Trade is most active with Singapore.

Sargossa Sea. A recent expedition sent by the Norwegian Government last year returned and reported their findings upon the existence of the famous Sargossa Sea. For years this sea has been famous as the great stagnant pond in which seaweed accumulated to such an extent that the passage of ships was impossible; and various romantic tales have always been circulated regarding this sea. The Norwegian expedition, however, stated that such

SASKATCHEWAN—SCHOOL LUNCHROOMS

tales were fabulous, and that no such sea existed, in reality. At least, they failed to find any traces of a sea such as had been described. The vessel *Michael Sars* was despatched to investigate, and reported as follows. The sea corresponds approximately to the anticyclone, existing over the north Atlantic. Around this centre of high-pressure the wind and surface-currents of the sea circulate in the direction of the hands of a watch. The Sargossa Sea is said to be south of the fortieth parallel of north latitude, between the meridians of the Azores and Charleston. It is here that the greatest amount of seaweed prevails. It hardly descends below the tenth parallel, however, except in the Gulf of Mexico. It is in the autumn that the flow of seaweed is greatest,—soon after the hurricane period has passed, in fact. For about five or six months these algæ float on the surface, after which they sink to the bottom. While it is acknowledged that there is a great quantity of material of the kind here, it is said that the stories told by sailors as to the nature of the Sargossa Sea are quite fantastic.

Saskatchewan. A province of Western Canada. The area is about 250,000 square miles, of which 27,000 square miles are water. The population in 1906 was 257,750, and is rapidly growing. The principal town is Regina. There are 41 members in the House of Representatives—one from each electoral district, and five members in the Executive Council. The Lieutenant-Governor is appointed by the Governor-General of Canada, and receives a salary of \$9,000 per annum. In 1908 the revenue and expenditure amounted to \$1,937,000, and \$2,417,700, respectively. The Chief-Justice of the Supreme Court is assisted by five inferior judges. There are eight district courts. At the close of 1906 there were 875 schools, with more than 1,000 teachers, and 31,275 pupils; government aid, \$1,448,000. In the census of 1901 the Roman Catholic population preponderated. About 86,000 square miles of land in Saskatchewan are fit for grain production. In 1908, 2,396,000 acres were under wheat yield, 34,742,000 bushels. Under oats, 930,100 acres yield, 29,205,000 bushels. Barley was grown on 81,000 acres, and the crop amounted to 1,952,000 bushels; the flax crop, from 110,000 acres, to 1,144,000 bushels. The live-stock industry is important, in the Province. There are about 80 manufacturing concerns, employing 1,445 people, paying \$721,900 in salaries and wages, and the value of the yearly output is about \$2,520,000. The Canadian Pacific, the Canadian Northern, and the Grand Trunk Railway systems pass through the Province. Facilities for communication are increasing very rapidly.

Scadding, Charles. Third P. E. bishop of Oregon and 232d in succession in the American episcopate. b. Toronto, Can., 25 Nov 1861. He was graduated from Trinity College, Toronto, A.B. 1885, was ordered deacon the same year, and ordained to the priesthood in 1886. He was assistant pastor of St George's church, New York City, under the Rev. W S Rainsford, 1886-90; rector of Christ Church, Middletown, N. Y., 1890-91; of Trinity Church, Toledo, Ohio, 1891-96; and Emmanuel Church, La Grange, Ill., 1896-1906. He was elected bishop of Oregon to succeed the Rt Rev. Benjamin Wistar Morris, deceased, and was consecrated third

bishop of the diocese of Oregon, 29 Sept. 1906, Bishops Tuttle, Seymour, and Whitehead officiating. He is the author of 'Dost Thou Believe' (1899); 'A Workable Graded System of Sunday School Instruction' (1896), 'Direct Answers to Plain Questions' (1899), besides many tracts and articles.

School Gardens. See GARDENS, SCHOOL

School Lunchrooms. The movement to provide a cheap nourishing lunch to the school children of New York is now past the stage of experiment and in the hands of the Board of Education. During 1910 the School Lunch Committee of the Public Education Association has been furnishing three-cent lunches to the pupils of two public schools, and not only have physicians reported on the great benefit to the children, but the committee has been able practically to make the venture self-sustaining. They are now seeking to experiment in other schools. Public School No 21, in Mott street, is one of the places where lunches have been served daily to 200 children for three cents per lunch. For that amount they could get some substantial dish suited to their desires, with two large slices of bread. Because of the racial diversity in this district the bills of fare vary from a thick soup of rice and tomatoes or rice and peas or spaghetti and tomatoes to a nourishing meat stew with olive oil. In addition there may be purchased for one cent extra a harmless dessert, such as baked apples, a pudding or the like. The bill of fare was prepared by food experts who examined the children from time to time and had an accurate idea of the food supplied. At another school, No 51, at No. 519 West 44th street, a similar experiment was made with success, but with an entirely different bill of fare. There the pupils were inclined to vegetable soups, meat stews, and the like. This experiment was self-sustaining, everything being purchased and paid for except the supervision. The committee has planned to establish a lunchroom in Broome street, another on the far East Side, and several in other congested districts. There is no charity in the movement, the promoters being satisfied that even very poor parents will sacrifice three cents a day for a child because of the health return.

"There is no question of the feasibility of the plan," according to the principal of one of the schools. "We now feed daily more than 200 children and the movement is growing in popularity with the parents. Although we had to pay for the original supplies for the experiment out of our own pockets, it is now about self-sustaining. The income pays for the cook and the dishwasher, who also helps to prepare the food. The committee makes the purchases. The food is prepared in the school, served in absolutely clean bowls upon small trays. The greatest care is taken to provide only such food as the children will like, and our system of service prevents any waste."

The success of the plan in New York City has aroused the interest of the education authorities in other cities. In November it was decided to establish lunch rooms in six of the largest schools in Chicago. Two of these rooms were to be in the foreign districts of the North, South, and West sides. It is the plan of the Chicago committee to limit the lunch to soup and bread and butter. One penny is to be charged for the lunch or breakfast. If

SCHOOL SAVINGS BANK—SEAL FISHERIES

a child is hungry, however, and is without a penny he will be fed. The girl pupils will be taught to set the tables and to serve the food. The ultimate aim is to extend the system to all the Chicago schools.

One cent lunches for school children were established in Dec. 1910, in the Jackson School, Chicago. At noon, 200 boys and girls filed into the basement lunchrooms and for a cent received a sandwich, an inch and a half thick, with jam between the slices of bread, a bowl of milk, and a small piece of candy. The demand was so great that the dining room could not accommodate them, and 500 children were turned away in the beginning owing to lack of accommodation. There are 20 rooms in this school—the largest in the city—and the total enrollment is more than 2,000. The school is in the heart of the Italian district, one of the most congested in Chicago.

School Savings Bank. See **BANKS, SCHOOL SAVINGS.**

Schooner Polly Tablet. See **"POLLY" TABLET.**

Schweibach, James. R. C. bishop: b. Platteau, Luxemburg, 15 Aug 1847. He received a private education, and attended the college of Deikirch, 1862-64, and in the latter year came to the United States and settled in Wisconsin. He was graduated from the Seminary of St. Francis, near Milwaukee, Wis., and in 1869 was ordered deacon by Bishop Hess, of La Crosse. He was ordained priest by Bishop T. L. Grace, at St. Paul's Cathedral, 16 June 1870, and was pastor of St. Mary's Church, La Crosse, 1870-92. On the death of Bishop Flasch, 3 Aug. 1901, he was made administrator of the diocese of La Crosse, and in the same year was appointed his successor, being consecrated 25 Feb. 1892, by Archbishop Katzer, assisted by Bishops Janssens and Cotter.

Scott, Harvey W. Newspaper editor: b. Tazewell County, Ill., 1 Feb. 1838, d. Baltimore, 7 Aug 1910. His boyhood was spent on the farm until, in 1852, his family removed to Oregon. Here he participated in the various vicissitudes of a frontier country, including fighting Indians, but managed to give himself a classical and law education. He found his life work, 1865, as editor of the *Oregonian*, at Portland, afterward becoming part owner and continuing his connection with that paper through life. The *Oregonian* gained great influence in the free silver campaign of 1896.

Scott, William Berryman. American geologist: b. 12 Feb 1853, at Cincinnati, Ohio; educated at Princeton University, where he graduated in 1878, and at the University of Heidelberg, Germany, from which institution he received the degree of Ph.D. in 1880. In 1906, he was honored with the degree of LL.D. by the University of Pennsylvania. On 18 Feb 1910, Doctor Scott was awarded the Wollaston Gold Medal for geological research, the highest award in the gift of the Geological Society of London. The medal was conferred upon Dr. Scott by the unanimous vote of the society at its annual meeting. In making the presentation, President W. J. Sollas gave a eulogistic account of the work of the American geologist which had so richly earned for him this mark of distinction. American Ambassador Whitelaw Reid received the medal on behalf of Doctor

Scott, who was not in England at the time, and thanked the society in the name of the recipient. Doctor Scott is at present Blair Professor of Geology at Princeton University. He is also a member of the National Academy of Sciences, and in 1906 was elected vice-president of the American Philosophical Society. He is the author of numerous works on geology and paleontology, as well as the editor and joint author of 'Scientific Expeditions to Patagonia' (1904).

Scottish Ship Canals. See **CANALS.**

Sea Island Cotton. See **COTTON, SEA ISLANDS.**

Seal Fisheries. As a direct result of the determination of the United States Government to exploit its Alaskan seal industry, instead, as hitherto, of leasing its rights, 12,920 seal skins, the property of the government and the season's yield, were sold in Dec. 1910, at London, realizing \$445,000. The sale was attended by George M. Bowers, Commissioner of the Bureau of Fisheries at Washington, representing the Department of Commerce and Labor. The skins came from the Pribiloff Islands all being of male animals, which is the first time such a thing has been known in a London salesroom, and which follows from the Government's policy never to kill female seals. Mr. Bowers said the average price fetched per skin was about \$33, which, although not quite so high as the previous year, was very satisfactory considering that the demand for sealskin had not been so brisk. In 1909, when the Government leased outright, it received only \$153,000 as its share of the proceeds of the sale. Until 1910 the business of killing and selling the sealskin product of the Pribiloff Islands had been let by contract, and, according to the provisions of the statutes, to the highest bidder. The seal industry is estimated to have returned to American capitalists and to the United States in general nearly \$50,000,000 since the purchase of Alaska and the Aleutian Islands from Russia, in 1867. In acquiring the seal industry at Pribiloff the total first year expenditure, in accordance with the appropriation of Congress, was \$169,500; of this sum a considerable portion was required to compensate the North American Commercial Company for its outfit, the purchase of some 300 native dwellings, together with boats, mules, a company storehouse, and other buildings. Before the appropriation the only buildings owned by the Government were the agent's residence and a small office building. The appropriation proved ample for all reasonable expenditure and the general cost of handling the year's business. It was freely and frequently stated that the cost of the seal industry exceeded \$500,000 annually. The Fish Commission urged that this claim was not based on fact, for the several revenue cutters engaged in the prohibition of seal piracy and the restriction of pelagic sealing to those waters outside the three marine mile limit of American jurisdiction were not engaged solely in this business, but would be patrolling Bering Sea in any event; and therefore only a fractional part of their annual upkeep expense should be chargeable to the protection of Pribiloff.

There was real danger of the herds becoming extinct owing to the raids of Japanese vessels. In October the revenue cutter *Manning*

SECRET SERVICE

brought word that the Japanese force in Bering Sea at that time comprised 25 vessels and 816 men, and 201 boats were employed. All these Japanese craft were boarded by the patrol ships at various times during the summer. Forty-five men were taken prisoners. Officers of the *Manning* estimated that the Japanese took fully 4,500 skins by pelagic sealing. There was unanimity of opinion that the Japanese would appear next season in still stronger force. The only effective way to prevent their onslaughts on the seal herd, it was declared, was to prohibit their craft from getting water in the American ports. This was the opinion held by the leading officers of the fleet. In the case of a vessel in distress she would be allowed, they said, sufficient water daily, but only for a day's supply at a time, and at the end of the season sufficient water to carry her home. This would be relieving her distress without aiding her to carry on pelagic sealing. The American boats seized two Japanese vessels during the season, the *Tokai Maru* and *Tora Mary*, and 11 Japanese were taken for illegal landing at St. Paul's Island. Officers of the *Manning* declared that the slaughter of the seal herds went on unabated, and that the diminution, which even among hundreds of animals had become perceptible, spelled positive extermination within a few years. The hand of the alien fisherman struck at the root of the industry, for it killed the helpless female while she swam far beyond the three-mile limits for food for the family. Fired upon when she comes up for air, the female seal makes toward the deadly missile out of curiosity and receives her death wound. Her pup on shore starves to death, for no other seal mother will nurture it. Thus two animals perish when one is killed. No American vessel under the present treaty can fish within 60 miles of the islands, while the Japanese are allowed to go up to the three-mile limit. More and more the law has been tightened on the Japanese fishermen by cutting off their food supply, and with another step or two the government will be able to compel them to provision their vessels in Japan for the fishing season.

The United States Government forbids all citizens of this country to engage in fur seal hunting. The law is sweeping, since it forbids seal hunting not only in the Bering Sea, but anywhere on the American coast. The Paris Award treaty to which Great Britain and the United States are parties, permits subjects of Great Britain to hunt seal on and after 1 August in the Bering Sea beyond a radius of 60 miles of the Pribiloff Islands. In other words from 1 August no British vessels can—and do—approach the Pribiloff Islands to within 60 miles.

Secret Service, United States. The arrests by agents of the Secret Service division and other qualified officers during the year ended 30 June 1910, number 316. Some of the offenses alleged were as follows: Manufacturing, having in possession, dealing in and passing counterfeit paper money (51); altering obligations of the United States, having in possession and passing altered obligations (58); manufacturing, passing and having in possession counterfeit silver coin (185). Of the arrests as above referred to, 177 were convicted; 29 were acquitted; 10 were not indicted; and 1 was nolled. Of the persons arrested, 192 were

born in the United States, 82 in Italy, and 13 in Russia. The altered and counterfeit notes secured by secret service agents during the fiscal year amounted to \$490,765 55, of which \$167,221 were foreign notes. The coins totalled \$16,185 34. Thirty dies and 202 molds were also secured. Among the miscellaneous contraband property received by agents of the service were plating outfits, reeding machines, numbering machines, planchette cutters, melting furnaces, metal-rolling machines, large press for punching metal, drop press, high-pressure air blower machine, buffing machine, scales, gas and oil stoves, ladles, crucibles, iron clamps, vises, melting pots, inks, paints, chemicals, also a large number of tools and counterfeiting material. The sundries included sheets of bond paper, books containing 100 counterfeit United States Navy Department blank checks, bogus Secret Service badges, facsimiles of foreign postal cards, photographs of United States drafts, books showing prints of United States notes and coins, clusters of counterfeit coins, boxes bearing impressions of United States coin, miniature photographs of foreign notes, forged paymaster's checks, planchettes, trade checks, and note-raisers' outfits. Low-grade silver coin was run into bullion and sold to the Philadelphia mint. The proceeds, amounting to \$286 94, were turned over to the treasurer of the United States.

Numerous passers of \$5 and \$2 counterfeits in the Eastern States were found to be identified more or less intimately with certain bands of blackmailing Italian criminals in New York. It was supposed that the counterfeit supplies were imported from Italy, but it was finally learned that the "plant" was on the banks of the Hudson not far from New York City. The conspirators had been known to the police for years as blackmailers, and under the skilful direction of Agent William J. Flynn, a perfect legal case was secured against them. They were convicted and sentenced by Judge Ray—Ignazio Lupo to 30 years, Giuseppe Morcello to 25 years, and the others from 18 to 15 years each. This division considered the most important victory for the Government since the breaking up of the Lancaster-Philadelphia gang of counterfeiters in 1898. The Philadelphia conspiracy was described as the greatest menace to the integrity of the currency ever conceived. There is still trouble in some districts over "raised" notes—altering the denomination of a one or two dollar bill to give it the appearance of a 10 or 20, but the public seems to be gradually becoming more educated in scrutinizing the paper money it handles. There was a distinct decline in the activity of coiners and little of the product of the year was dangerously deceptive.

There is to-day, as part of the Federal Government, a new Secret Service, which is larger and more powerful because of the greater latitude it is given in its work. Its duties take its agents to all points of the world. It is authorized to act for every branch of the government, and to handle all manner of cases of violation of the Federal statutes. It has come into being only in the last two years, yet it employs more secret agents, spends more money, performs a greater variety of service, than has any other such body of men. It is under the Department of Justice, and its province is to gather evi-

SEDAN MONUMENT — SENATORS

dence in all manner of cases that this department represents before the courts. Anti-trust prosecutions, violations of the national banking laws, land graft, bucket shop frauds, night riding, smuggling, peonage, white slavery, and a hundred other counts come under its jurisdiction. In the work of all the departments it takes hold where investigations point to crime. There are investigating bureaus in most of the departments. These amass facts and figures but no evidence. The province of the new Secret Service is to procure evidence admissible in court in any case where the Government may appear as the prosecutor. The force, of which S. W. Finch is chief, numbers nearly 200 men. For the maintenance of this force Congress last year appropriated \$485,000 for the "protection, prevention, and prosecution of crime." For the "detection, prevention and prosecution of infringements of the Anti-Trust law," an additional \$200,000 was appropriated.

Sedan Monument. A monument, "Aux Braves Gens," on the Sedan battlefield, unveiled in Nov. 1910. It commemorates the defense in the Franco-German war of the famous farm of Bazelles, which 200 men held against a Prussian army until only 43 remained alive. When the 43 left the farm they were permitted to retain their swords and rifles and were saluted by the Prussian army as they marched past. The life on the Bazelles farm has not been touched since the war. The walls and furniture are riddled with bullets and the clock which a bullet stopped still marks the same hour.

Seedless Tomatoes. See TOMATOES.

Seine Flood. See FLOODS.

Seismology. See EARTHQUAKES.

Seligman, Edwin Robert Anderson. American political economist. b. New York, 25 April 1861. He was graduated from Columbia in 1879, receiving his degree of Ph. D. in 1885, and LL.D. in 1904. After studying abroad he was invited to Columbia as lecturer on economics, and has retained his connection with that university ever since, as adjunct professor of political economy, 1888-91, and full professor since that date. He is connected with scores of societies and academies in America and abroad, and has been associated with many social reform movements, and as editor and author has produced many works of high value. Among other books may be mentioned 'Railway Tariffs' (1887); 'Progressive Taxation in Theory and Practice' (1894); 'The Shifting and Incidents of Taxation' (1899); and 'Essays on Taxation' (1900). His special contributions to human thought have done much to settle the problems of taxation, by helping tax authorities everywhere in the working out of more equitable methods.

Sellstedt, Lars Gustaf. American artist: b. Sweden, 30 April 1819. Educated at Sundsvall and at Hernösand, Sweden. Mr Sellstedt is the oldest living member of the National Academy of Design, and enjoys the distinction of having painted the portraits of two Presidents of the United States, and these as widely separated as Fillmore and Cleveland. Mr. Sellstedt first began to earn money in 1832 by working on a ship. For two years he followed the sea, sharing in all the rough and tumble experiences which came to sailors of that time, and in 1834 he came to the United States as

cabin boy aboard the barque *Prudent*. For three years he knocked around this country, chiefly in New York, earning his living by a variety of positions calling for hard labor. In 1837 he went back to the sea, serving a few years on a United States man-of-war. In 1842 he settled in Buffalo, N. Y., which city has remained his residence ever since. It was here that he began his first serious work along artistic lines.

Mr Sellstedt had always displayed an aptitude for sketching, and has produced some strikingly clever things on smooth ivory with a penknife. When he first located in Buffalo he stayed at the Sailor's Home, where the superintendent, an old sea captain, happened to be a lover of art. This led young Sellstedt to essay his portrait, and he produced a very presentable likeness. Much encouraged, he began the reproduction of a picture from a small steel engraving. While thus engaged two Buffalo society ladies became acquainted with his work. Backed by their interest, he began to take regular lessons in art, doing work on the lake vessels which touched at Buffalo, to pay for these lessons. From the outset, his ability was marked though for a time his work did not yield him overmuch in a monetary way.

For his first portrait he was paid only two dollars. He was soon able, however, to secure orders for portraits at good prices, and rented a studio at \$100 a year, and gave his occupation to the census-taker as "artist." He still found it necessary, however, to do occasional work on the boats plying down the St. Lawrence. But all the while his skilful craftsmanship was gradually making itself felt, and he was gaining a reputation. He began to exhibit at the spring exhibitions of the National Academy of Design. For a long period his work called forth no particular comment, but in 1873 he sent in a large portrait of himself which attracted universal attention, and was the means of his being elected an associate of the Academy. Two years later, in 1875, he was made a full-fledged Academician. Since that time his career has been an unending series of successes. Besides painting the portraits of Fillmore and Cleveland, Mr. Sellstedt has immortalized in oils many other notable figures both in this country and abroad. His marines, too, are of unusual excellence, possessing all the understanding of the sea which he acquired during his varied experiences before the mast. Mr. Sellstedt is the author of 'From Forecastle to Academy' (1905), an autobiography of more than ordinary interest, which, besides his own fascinating life story, contains intimate personalities of all the great men and women he has met and painted.

Senators, Popular Election of. The movement for popular election of United States Senators has now taken such proportions that it may well be said to be national. Most of the recent State conventions, regardless of party, have taken cognizance of this popular demand, and inserted a plank in their platforms favoring the reform. The list of the State conventions that have declared in favor of this plan is of necessity a long one: Democratic conventions in Maine, Indiana, Ohio, Minnesota, Michigan, Connecticut, New Hampshire, Massachusetts, New Jersey, Utah, South Dakota, Vermont, New Mexico, New York, Rhode Island, Wyoming, Iowa, Wisconsin, North Dakota, Nevada, Ida-

ho, California, Illinois, Kansas, Oklahoma, Montana; and Republican conventions in Iowa, Wisconsin, North Dakota, Nevada, Idaho, California, Illinois, Kansas, Oklahoma, Montana—26 States in all. Many of the other States would doubtless have joined the column, but these either had no State elections in 1910 or made no party platforms.

The reasons for which the popular election of United States Senators is so persistently demanded, and for which a constitutional amendment is being asked, are quite numerous. In a book on 'The Election of Senators,' by Dr G. K. Haynes, they are summarized thus. The proposed change in the method of electing United States Senators would (1) make the Senate a more consistent and effective political institution, (2) improve the tone of the Senate; (3) make the Senate responsible to the people; (4) make Senators thus elected command public confidence; (5) lessen the influence of wealth upon the Senate; (6) tend to divorce National from State and local politics; (7) promote the reform of representation in State legislatures; (8) promote nomination and election of members of the legislature upon the simple issue of their fitness for such service, (9) improve the State legislatures; (10) leave legislatures free to do their normal work; (11) elevate the tone of State and municipal politics; (12) insure the States' being represented in the Senate; (13) prevent the worst evils of minority representation, (14) promote "home rule" in the States, and (15) give the people the final verdict upon senatorial candidates.

Convincing as many of these arguments are, Congress has so far failed to adopt the proposed constitutional amendment, although the matter was up for consideration four times (in 1894, 1898, 1900, 1902), and the House favored it by the necessary two-thirds majority. Indeed, it is coming to be very much doubted, judging from such expressions as Senator Robert E. Owen's (made in a speech in the United States Senate, 31 May, 1910) whether the majority of Senators will ever approve the measure, which is being viewed by them in a spirit of antagonism. Likewise considerable anxiety is felt concerning the other avenue of approach—securing explicit demands from three-fourths of the States, which, addressed to Congress, shall bring about a constitutional convention (in accordance with a constitutional provision to this effect). It is feared that the numerous individual appeals and resolutions addressed to Congress contained so many discrepancies and contradictions that they will never pass muster in an unfriendly Senate. Thus the numerical two-thirds of the States needed by constitutional requirement shrinks to a minority of the Senate. This very thing, it is pointed out (Bulletin No. 1, published by the House of Governors, Nov. 1910), has actually happened again and again. Hence the meagre results of the long agitation (since 1895) for the popular election of Senators.

In view of these past failures, and the strong improbability of future success resulting from the old method—individual State activity—an entirely new plan of procedure is now proposed. This is set forth in the Bulletin just referred to. The proposal is, that the Governors' Conference discuss the question of concerted action toward securing a constitutional amendment.

The plan, briefly, is to have the House of Governors, representing 46 States, draw up a form of resolution or application that would be so inclusive as to preclude all possibility of attack by Congress, then to have every State make its request to Congress on this uniform document. Since 42 legislatures are to meet in 1911, the time for such action is believed to be especially opportune. This concerted action must, it is expected, bring about the needed reform in the manner of electing United States Senators, for, even were both houses of Congress opposed to the measure, a call made by two-thirds of the States is mandatory on Congress to call the Constitutional Convention to consider the necessary amendment.

That the issue of the popular election of Senators is absolutely non-partisan, is well shown by President Taft's recent endorsement of it. This fact, together with the great number of States now heartily in favor of the movement, and the House of Governors enthusiastically working for it, would seem to indicate that the popular demand for the necessary constitutional amendment will soon have to be heeded by the men at Washington.

Senegal. A French Protectorate in West Africa. The area is estimated at 74,000 square miles, and the population at 1,130,900, of whom 4,850 are French, and 2,450 other foreigners. St. Louis (with about 24,700 inhabitants) is the capital of the colony. Other important towns are Dakar, 24,900 inhabitants—the seat of Government for French West Africa; Rufisque, 24,450 inhabitants, and Goree, 1,600 inhabitants. There is a Lieutenant-Governor, responsible to the Governor-General of the West African colony. One representative from the local Government is sent to the French Parliament. The colonial inspector of education has oversight of education in Senegal. There were 35 public schools in 1908, with 3,600 pupils, and 4 Catholic schools, with about 50 pupils. A Mussulman school for secondary instruction exists at St. Louis; pupils number 20. At the capital and at Dakar there are a commercial institution, a normal school for natives, and a superior technical school. The Consolidated Bank of West Africa has a capital of \$1,180,000. It carries on a good commercial business in the Protectorate. Among the agricultural products are ground nuts, millet, maize, rice, castor beans, cocoanuts, etc. Gum and rubber are gathered. The weaving of cloths, pottery manufacture, brick making, and jewelry are the most important industries of Senegal. The leading imports into the colony are cottons, food produce, metals, etc., and the chief exports abroad are oil seeds and rubber. Imports amounted in 1908 to the value of about \$13,083,500, and exports to the value of \$8,867,400. Vessels entered at the ports in 1907, 620. The following year, 2,025 vessels of about 2,816,000 tons entered. Dakar is the best port of Senegal. It is visited by French steamers, and by ships of a British and a German line. In the rainy season there is inland water communication to a distance of 500 miles. A cable connects Dakar with Brest. There are about 1,350 miles of telegraph line and 100 miles of telephone. Railways connect the chief towns, and extend from Kayes to the Niger; total length of line, more than 500 miles.

SERUM THERAPY

Serum Therapy. Among the important advances made by medical science during the past few years, none has been more important and more far-reaching in its effects than serum therapy, and none holds out brighter hopes for the coming century's work than this. Serum therapy in one form or another is extremely old, but it did not take definite scientific form until Richet and Héricourt, in 1888, made the interesting discovery that rabbits did not die, even if they received injections of bacteria in such quantities that they would normally have died from the effects—provided that they had recently received injections of the blood of dogs, which had been treated with increasing doses of the same bacteria until they became immune to doses which would normally have proved fatal to them. In this way it was discovered that immunity could be transferred to another animal, in much the same way that Pasteur has previously rendered the individual immune by ever-increasing doses of the disease germ.

Serum therapy consists in the treatment of disease by injecting serum into the blood—this serum, or watery part, having been extracted from the blood of an animal immune to the disease in question. In this way, gradually increasing doses have been administered, until several hundred times the original dose can be taken, and a dose which if taken at first would have proved fatal at once. This acquired immunity is thought to be due to the presence of definite protective substances in the blood, which are increased artificially by means of the inoculation. This theory was first advanced by Behring, but is now very generally accepted.

Dr. Fritz Meyer, in a recent article in *Umschau* (*Scientific American Supplement*, 29 Jan. 1910) says

"Diseases of three classes are caused by bacteria. In the first class, represented by diphtheria, dysentery, and tetanus, the bacteria settle in one part of the body, where they multiply and produce poisonous substances or toxins. The toxins enter the circulation of the blood, but the bacteria do not. In the second class, represented by erysipelas, puerperal fever, pneumonia, meningitis, and diseases resulting from the infection of wounds, the bacteria enter the circulation of the blood and invade every part of the body. Diseases of this class are called septic diseases and are very often fatal. In none of them has any true toxin, or soluble poison, been discovered. In the third class, represented by typhoid fever, cholera, and plague, both the bacteria and their toxins enter the circulation.

"In France, Austria, and other countries, therapeutic serums are prepared in government establishments, called Pasteur Institutes. In Germany, a few great chemical firms have taken up the work. The serum is obtained from the blood of horses. The weight of the animal having been determined, a minimum dose of a toxin of bacterial culture is injected, according as the subject is to produce an antitoxin serum or an antibacterial serum. The horse reacts to the injection with slight fever and other symptoms of ill-health. After these have passed, and the initial weight has been regained, a second dose, twice as large as the first, is injected. In this way the injections are repeated and increased for a few months, until the horse finally fails to react to a dose large

enough to kill 1,000 unprepared horses. Three weeks after this condition of immunity has been attained about two gallons of blood are drawn from the horse's veins. After the blood has coagulated the clear serum is separated from the clot and its curative power is tested by injecting it into the circulation of mice, guinea pigs, monkeys, and other small animals, which have previously received injections of the toxin or the bacterial culture of the disease in question. This examination in the factory is followed by rigid official tests applied at the Ehrlich Institute in Frankfurt. The serum cannot be sold for use on human beings until its potency has been officially determined and stamped upon the bottles. In the case of diphtheria serum, the only one for which the system of gradation adopted can be regarded as final—the unit is a quantity of antitoxin sufficient to protect a guinea pig against 100 times the normally deadly dose of the toxin of diphtheria. A serum which contains one unit of antitoxin in each cubic centimeter, is called a normal serum and its potency is 1. A serum 1,000 times as strong is of potency 1,000, and so on."

It is interesting to note that tuberculosis has so far received no explanation, and no immediate hope is held out that a serum will be found in the very near future, capable of curing this fatal disease, from which more people die at the present time than from any other single malady. It is unknown whether the bacteria found in the lungs kill by their mere multiplication or by producing large quantities of toxin, which are absorbed by the blood. Three general classes or divisions of serums are now recognized—serums containing antitoxins, or substances, which neutralize the toxins of diseases of the first class; anti-bacterial toxins, which check the multiplication of bacteria, in diseases of the second class, and serums which combine both of these properties and are efficacious in diseases of the third class.

Of these serums, the first class is so far the most successful. In cases of diphtheria, for example, the patient can now be treated, and in 36 hours or so is convalescent, whereas formerly it required several weeks to effect this desirable result. The anti-bacterial serums are in far less satisfactory a condition, and they must be limited, very largely, in their action to preventative measures; that is, they must be administered while the bacteria are still at the point of entrance and before they have become disseminated through the body. The reason is that every bacterium is a new source of infection, and even those which have been killed by the serum may cause serious injury. As to the third class of serum, which is required both to offset the action of the toxins and kill the bacteria, very little has as yet been accomplished; and the treatment may be said to be still in its infancy. There is much evidence, however, that some degree of success will be attained in this direction, before very long. Better results would doubtless be obtained if the treatment were adopted at once, instead of waiting until the disease had well advanced before submitting to inoculation. Behring asserts that 20,000 lives are annually saved in Germany alone, as a result of the diphtheria antitoxin treatment. The benefits derived from an early use of the antitoxin are due to the fact that the invading bacteria are attacked and

SERUM THERAPY—SERVIA

destroyed immediately upon their entrance into the blood stream, and they have not as yet had a chance to reach any of the great vital organs. Says Doctor Meyer

"In contrast to this preventative serum treatment is the curative treatment, employed after the disease has actually appeared. In the latter case, the objects of the treatment are to check the multiplication of the bacteria and their production of toxins, and to free the cells of the body from the toxins which have already become attached to them. It is not certain that the second object can be accomplished. There is good reason to believe that a cell, once poisoned, is incurable and doomed to death. But if the general organism is freed from poison, it easily survives the loss of a few cells, and replaces them by new ones. If the injury is excessive a scar is formed by the substitution of useless connective tissue for active cells, but if the disease is quickly checked and the general vitality quickly imparted, no permanent lesion is produced. Hence the action of serums is essentially preventative, even when it appears to be curative, for it is the protection of the tissues which have not yet been attacked that assures the replacement of the parts which have been destroyed."

To sum up, then, we see that in the first class of diseases, much progress has already been made, and anti-toxins have been developed which undoubtedly cure many cases of disease within a few hours by preventing the action of the toxins secreted by the bacteria. In the second class of diseases, in which the bacteria are absorbed into the general circulation, some progress has been made, in the use of anti-bacterial serums; and there is ground for supposing that much more will be accomplished in this field in the near future. In the third class of diseases, in which both the bacteria and their toxins are absorbed, but little has been done toward finding an adequate serum; but even here, there is some hope that definite progress will soon be made, and then this class of diseases will cease to have the terror which they now have, whenever their names are mentioned. The one apparently simple but incurable disease (by serum therapy) is tuberculosis; and here no better method has yet been devised than the simple hygienic measures of fresh air, light, proper food, etc. Even so, the employment of serums have revolutionized modern medicine, and they have doubtless been the means of saving many thousands of human lives—with a prospect that many more thousands will be saved in the future.

The employment of serums and vaccines is constantly increasing; and, while great skepticism still exists in some quarters as to the value of this method of treatment, the majority of medical men would probably agree that much good is to be derived from their use. Sir Almroth E. Wright has stated his views of the present value of this system of treatment in the *Lancet*, and they may be summarized as follows:

Vaccine therapy promises to be brilliantly successful in pneumonia, it holds out promise in typhoid fever and in many forms of rheumatism; it supplies the only ray of hope in endocarditis; inoculation of a system of regulated auto-inoculation is the only standby in phthisis; it has already proved its superiority over other forms of tuberculous glands, and

many other forms of tuberculous infection, it has also given very favorable results in diseases of the mouth, nose, and ear.

Extensive tuberculous ulcers have healed up under vaccine therapy without the foundation of scar tissue. X-ray dermatitis, with extensive streptococcus infection, and inflammatory trouble of the roots of the teeth, have responded favorably to the use of vaccine. It is probable, also, that it may yet be of value in hay fever, calculus, indigestion, vomiting, epilepsy, cancer, and diabetes. As regards the bacteriological limitations, it is noted that a complete and exact diagnosis is a necessary preliminary to a successful application of vaccine therapy.

Servia. A principality in southeastern Europe.

Area and Population. There are 18 departments in the country, of which the total area is 18,650 square miles, and the population about 2,688,000—75,000 more males than females. Of the population in 1901, 5,900 were Turks, and 1,850 Austrians. There were, besides, Jews, Germans, Bulgarians, Greeks, Gypsies, etc. In 1908 there were 25,900 marriages, 103,900 births, and 66,900 deaths. The capital of the State is Belgrade, with 77,800 inhabitants. Other cities are Nish, 21,950 inhabitants, Kragonyevatz, 15,600; Leskovatz, 13,650, Pozarevatz, 12,150.

Government.—Servia became independent of Turkish rule by proclamation of 1878, consequent to the Treaty of Berlin, 13 July. The factor of the Government representing the people is the Assembly, consisting of 160 members, elected from the various departments. Citizens over 30 years old, paying direct taxes amounting to \$12, may be candidates for the Assembly. Males over 21 years of age, having \$3 taxes, enjoy the franchise. The Assembly sits every year, elections take place every four years. The Assembly and the King appoint the members of a State Council, which exercises a wide influence in the adjudication of political matters, and the regulation of the revenue, land appropriations, etc. The Assembly and the King, also, constitute the legislative power in the land. The King has a cabinet of eight ministers, in charge of the ordinary departments of the government, which is conducted in accordance with the constitution of 1889. The heir apparent of Servia is Prince Alexander, born 1888.

Army.—See ARMIES OF THE WORLD.

Finance.—The government revenue amounted in 1909 to about \$20,210,600, and the expenditure to \$20,147,100. The public debt in that year was \$104,705,000. The chief sources of revenue for 1909 were about as follows: direct taxes, \$5,800,000; monopolies, \$5,600,000; customs, \$2,350,000, railways of the State, \$2,140,000; excise, \$1,200,000, etc. The principal items of expenditure were war, \$5,400,000; debt charge, \$5,390,000; public works, \$2,300,000; finance, \$2,050,000, instruction, etc., \$1,475,000; pensions, etc., \$940,000; interior, \$935,000; commerce and agriculture, \$600,000, etc. The monetary unit in Servia is the "dinar," worth about 20 cents. Coins (silver, bronze, nickel) of various denominations are in circulation. The leading bank is the National Bank of Servia, at the capital, with a paid-up capital stock of \$1,300,000; the Export Bank, doing a good commercial business, and the Uprawa Fondowa, the principal function of which government in-

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stitution is to lend money toward the promotion of agriculture.

Justice, Religion, and Education—Justice is administered in 24 courts of first instance, an appellate court, a commercial tribunal, and a cassation court. The judges are appointed by the sovereign. Prisoners in the gaols numbered 3,340 in 1907. Greek Orthodoxy is the State religion, but religious toleration is exercised. There were 750 places of worship in 1907, and over 50 monasteries; clergymen, 1,050, and monks, about 100. Roman Catholics in that year numbered 10,400; Protestants, 1,400; Jews, 5,730; Mohammedan Turks, 3,050; and Mohammedan Gypsies, 11,700. With the exception of primary schools of instruction, the State supports educational institutions. The salaries of the teachers of elementary schools alone, are paid by the government, municipalities meeting all other expenses. There are several private schools. For primary instruction, which is free and compulsory, there were in 1907, 1,290 schools, with 2,375 teachers, and 132,050 pupils. For secondary education there were 20 establishments, with 330 teachers and 6,050 pupils. Besides these there were one theological school, four normal schools, and four special schools, etc. The University of Belgrade was founded in 1838, and has 75 professors, and more than 1,000 students. The total expenditure of the State on education in 1906 was about \$1,381,000, of which about \$915,000 was spent on primary instruction.

Industries and Trade—Of the total population, about 2,093,950 were engaged in agriculture in 1900. In 1904, 4,607,500 acres were under cultivation, and 3,818,600 under forest growth. Some of the chief crops in 1907 were: maize, 4,216 tons, produced from 1,357,830 acres; meadow grass, 2,848 tons, from 885,740 acres; plums, 2,836 tons, 466,550 acres; wheat, 2,242 tons, 907,980 acres; barley, 672 tons, 250,230 acres, and oats, 413 tons, from 237,430 acres. Tobacco was grown on 5,040 acres, vines on 86,145 acres; and hemp seed and flax seed, etc., on 40,280, producing 136,320 cwt. Silk is cultivated, nearly 10,000 persons being engaged in that industry in 1907. The forests contain fir, beech, and oak trees. Livestock in 1905 included 174,350 horses; 969,950 cattle; 3,160,150 sheep; 908,100 swine, and 510,050 goats. The following minerals are worked: gold, copper, lead, and zinc ore, antimony, silver, etc. Other mineral deposits are iron, mercury, asbestos, arsenic, chromium, graphite, gypsum, sulphur, and various kinds of stone. Coal and lignite, however, are the chief mine-products; the output weighing over 269,000 tons in 1907, and being valued at about \$609,000. Employees of the mines in that year numbered 5,420. Among the most successful industries of the country are flour milling, brewing, weaving, tanning, bootmaking, pottery, and iron working. The total imports into Servia in 1908 amounted to the value of about \$14,749,000 and the exports abroad to about \$14,722,300. The leading articles of trade for that year and their respective values were approximately as follows: Imports: cotton and cottons, \$2,660,000; steam engines, \$495,000; woollens, \$455,000; hides, \$415,000; iron, \$380,000; machinery, \$240,000; sugar, \$190,000; and salt, \$135,000. Exports: wheat, \$2,300,000; prunes, \$2,070,000; maize, \$1,160,000; barley, \$845,000; hides, \$700,000; copper, \$655,000; pre-

served plums, \$650,000; and meat, \$510,000. The five leading countries in Servian trade for 1908 were Austria-Hungary, supplying and receiving the value of \$10,730,000; Germany, \$7,075,000; Belgium, \$3,545,000; Turkey, \$2,820,000, and Great Britain \$1,860,000. The imports and exports for 1909 amounted to \$14,339,000, and \$18,131,000, respectively.

Railways, Posts, and Telegraphs.—A railway in the country and its branches, reaches a total distance of about 420 miles. Navigable rivers and about 3,500 miles of good roads, render the absence of railway facilities considerably less than a commercial calamity. Postoffices in 1908 numbered 1,500. Receipts from the postoffice and telegraph services aggregated, in 1908, \$526,000; the expenditure was about \$500,000. There were in that year 2,140 miles of telegraph line, operated through 180 offices, belonging to the State. The telephone systems of the country had 412 miles of line in 1908, and about 4,450 miles of wire.

Sevier, Clara Driscoll. American author: b. St. Mary's, Texas, 2 April 1881; educated in private schools in Texas, New York, and France. Mrs. Sevier is particularly remembered in Texas for her efforts to save the Alamo, for which service the Daughters of the Republic of Texas have bestowed upon her the honorary title of "Custodian of the Alamo." At their 1910 meeting the New York Texas Club, of which Mrs. Sevier is president, held a special celebration in honor of her successful work in saving this historic site to their state. Mrs. Sevier is a typical out-door woman, and still maintains a ranch in Texas, where she spends her summers. At one time she served as deputy sheriff. Her writings all reflect her love of Texas and the life of the ranches. They are as follows: 'The Girl of La Gloria' (1905), 'In the Shadow of the Alamo' (1906), and a comic opera, 'Mexicana' (1906).

Sewage. The pollution of waters from sewage, the chief cause of typhoid fever and contributory to other diseases, attracted attention during 1910 principally on account of the spread of cholera and the plague in Russia, where 100,000 persons died during the year, and similar outbreaks of the diseases in Mediterranean ports. Strict enforcement of the quarantine prevented the diseases from spreading to the United States, but the danger of wide spread epidemics in the event of their escaping the vigilance of the Public Health Service gave rise to renewed interest in one of the most serious unsolved problems in this country. The rule is almost universal to dump the sewage into the nearest stream, allowing it to float down to pollute the water below. This is believed to be directly responsible for the annual death rate from typhoid of 11,000.

The problem, however, presented itself nowhere in so striking a form as in New York City harbor, where the startling discovery was made that sewage was not all carried out to sea on the ebb tide, but in some cases was deposited on the bottom of the harbor ten feet thick. In fact the condition of New York harbor had become so dangerous by 1910 that the methods by which sewage is disposed of, according to the Metropolitan Sewage Commission, were in need of immediate and far-reaching improvement. At that time 600,000,000 gallons of sewage were being poured into the harbor

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every day, and sickness in various forms resulted from it

The immediate danger, great as it was, did not appear to the commission of so much importance as the condition in which it would be by the time the city had doubled in population. Owing to the peculiar situation of New York with only the narrow passage for the waters out into the open sea, ordinary means, such as some European cities have adopted, were hardly feasible. Some sort of purification appeared necessary, but there was no indication that the commission's recommendation would be immediately acted upon.

Some plan of action was, however, urgent, on account of new sewers being built and others planned. The new sewers of Essex and Union counties, New Jersey, began during this period to pour 21,000,000 gallons daily into Newark Bay, which emptied into the New York harbor by way of the Kill von Kull; the Bronx valley sewer was also built to pour 90,000,000 gallons daily into the Hudson at Mt. St. Vincent, and a new sewer in the Passaic Valley, New Jersey, had been suggested to carry 630,000,000 gallons daily into New York harbor.

To determine the disposal of the sewage the commission tested the water at various points in the harbor and along the coast, and discovered that a portion of the sewage moved constantly back and forth within the harbor until it settled to the bottom. The waters outside the harbor were also found to be polluted to a point 20 miles south of Long Branch, N. J. At Yonkers in the Hudson River, past which the sewage was carried by the in-flowing tide, 5,300 bacteria were found to the cubic centimeter, and at a point 10 miles out to sea from Long Branch the average cubic centimeter contained 120 bacteria derived from sewage. The greatest pollution of the waters, however, were found in the Passaic River at Newark, the Gowanus canal, Newtown Creek, and the Wallabout canals, which were so filthy that it was not necessary to take samples to prove it. At Newark the Passaic contains 92,000 filth bacteria to the cubic centimeter. Newark Bay contains 74,000 bacteria per cubic centimeter, and the Harlem River, 15,500. To remedy the matter it was proposed that an interstate commission be appointed to discover a remedy.

Berlin has solved its sewage problem by dumping it on an area of 35 square miles, which is owned by the city, where as much as possible is utilized for the manufacture of fertilizer, thus saving the valuable qualities of sewage for economical use. Paris has a somewhat similar plan by which the sewage is pumped away from the city and utilized for the same purpose. London also pumps its sewage down the Thames, and, after it is partly purified, permits it to enter the Thames at a point which insures its being carried to sea on the high tides, so that the river at London is practically free from sewage. Dublin, Glasgow, Belfast, and a number of other European cities have followed the same idea, but it has been put into effect in this country only in the case of a few cities. Marseilles, which was greatly troubled with sewage, formerly tunneled a mountain to find a suitable outlet for it. In this country Boston has the best sewage system, pumping it far out to sea. Philadelphia, in 1910 planned a pumping system, and Baltimore has progressed considerably on one.

Sewerage Purification. See SEWERAGE.

Sex, Control of. Speculations are constantly being offered, and theories propounded, as to the control of sex in generation. Several years ago, Mr. Samuel H. Terry published a book entitled 'The Secret of Sex,' which attempted to give "the law for controlling sex in generation." The "law," as formulated by Mr. Terry, was as follows. "At the generation of male offspring, the mother must be in a higher degree of sexual excitement than the father. And reversely, at the generation of female offspring, the father must be in a higher state of such excitement than the mother." This theory was supported by a great showing of proof; but has never been accepted by the scientific world as in any way a general "law." And the same may be said of all theories advanced to date. Only recently, however, Prof. W. E. Castle, of Harvard, has asserted that "The reproduction of the species is a chemical process, and can be governed as well as any chemical process now occurring in the laboratory. We have but to know the laws and then apply them, to produce the sort of human being desired." Modern science—especially cytology—will doubtless succeed, it is claimed, in solving this problem—the control of sex—before many years have elapsed.

Meanwhile, various theories have arisen—all, however, unsupported by any such adequate scientific evidence as would warrant their being taken as proved facts. Thus, only recently, Dr. Julia Seaton Sears has asserted that she has been enabled for years to control sex in generation by means of proper diet and thought. "If the parents wish a son, the prospective mother diets upon heavy foods, such as rare meats and thick soups. If the parents desire a girl, the sun-kissed foods must be eaten—such as grains of all kinds, green vegetables, and plenty of fruit." "Concentration of mind," is also considered essential for the success of the experiment. All such theories have as yet, however, received no confirmation upon a wide scale, such as would be necessary to establish them upon a scientific basis.

Shackleton, Sir Ernest Henry. English naval officer and explorer; b. Kilkee, Ireland, 1874. After his education at Dulwich College, London, he became lieutenant in the Royal Navy Reserve, and in 1901 sailed with Captain Scott on his first Antarctic expedition, reaching, two years later, a point 463 miles from the South Pole. In 1907 Lieutenant Shackleton in the *Nimrod*, commanded another expedition to the Antarctic, and on 9 June 1909 reached 88° 23' south latitude, the nearest approach to the South Pole on record—only 97 geographical miles from that coveted point. On his return he was received with distinguished honors and decorations from the government and from geographical societies in all parts of the world. In 1909 he published 'The Heart of the Antarctic' in two volumes; and in 1910 assisted Captain Scott to organize another expedition to the South Polar region, which started 1 June of that year.

Shafroth, John Franklin. American politician; b. Fayette, Mo., 9 June 1854; graduated B. S. University of Michigan 1875, LL.D. 1909; was admitted to the Missouri bar in 1876, and practiced at Fayette, Mo., 1876-9, and at Denver since 1879. He was city attorney 1887-91; member of Congress from 1895 to 1905 from

the 1st Colorado district, and refused to retain his seat in the 58th Congress, 15 Feb. 1904, on the ground that the election had been tainted by fraud. He was elected governor of Colorado in 1909, and was reelected 1911. In politics he is a Democrat.

Shakers. The name given to the members of the United Society of True Believers in Christ's Second Appearing, formerly applicable to their custom of violent motion in worship, which has been abandoned for the regular and uniform methods of other churches. Although the Society originated in England with Ann Lee, it was established by its founder and seven others in the United States near Albany, N. Y., during the early days of the Republic. The Shakers have rapidly decreased in membership in the last 15 years from over 4,000 to about 1,000. There are 17 communities located in New York, Massachusetts, Maine, New Hampshire, Connecticut, Georgia, Florida, Ohio, and Kentucky. The generally recognized headquarters of the Society is located at Mt. Lebanon, N. Y., the largest community settlement. With the decreasing numbers the Shakers are losing their reputation of great prosperity and forehandedness.

Shaughnessy, Sir Thomas. Canadian Railway president b in Milwaukee, 1853. He began his career as a railway man in his 16th year, as a clerk in the office of the purchasing agent of the Chicago, Milwaukee and St. Paul Railway, at Milwaukee, and remained in that department several years, until he was appointed general storekeeper. His service with the St. Paul road extended up to 1884, when he became general purchasing agent of the Canadian Pacific. From that position he was advanced to others until he reached the presidency. Under Sir Thomas the railway has added an enormous mileage of new track and branches in Canada, has taken a grip on international traffic through acquiring control of the Wisconsin Central and the Soo Line railways, giving access to and facilities in Chicago, and has become an actual sea-to-sea system through entrance into Halifax over the tracks of the Intercolonial Railway. But in view of its far-reaching effect upon Canadian development, the most important feature of his administration has been its work in populating the western provinces. The Canadian Pacific is the greatest of all corporate land and real estate owners. In handling the development of the country, Sir Thomas has adhered closely to the axiom that the prosperity of a railway must depend upon the prosperity of the units in the population it serves. While the land sales have been handled by one of the most highly organized systems of publicity and agency ever known, the railway company has never sought a profit in land sales, but has endeavored to attract the best class of settlers, and to so deal with them as to help get the land into well-managed cultivation, looking to the increase of traffic that must follow. This policy has gone farther than any other one influence in bringing forward the territory served by the Canadian Pacific between the Great Lakes and the Rockies. The company is the owner also of mines, farms, hotels, telegraphs, and steamship lines on both oceans. With all its various and complex interests, belting the continent and anchored across the seas in Europe and Asia, its affairs have been so ordered as to move with

precision and ease. In recognition of his services to the British Empire in the development of the Canadian Dominion, Sir Thomas was knighted by King Edward in 1901.

Shaw, George Bernard. Irish dramatist, critic, and lecturer; b Dublin 26 July 1856. "Argumentative, dogmatic, and unconvincible, susceptible to criticism himself, yet severe in his criticisms of others; quiet in temper, a curious mixture of caution and liberality; immense wealth of imagination, extreme eccentricity of ideas, and disregard of truth, all notions and opinions being colored by fancy until facts are completely lost sight of"—is the account given of this brilliant author by Dr Archibald Henderson of the University of North Carolina, quoting the observations of a skilled palmist. "His ability to see facts without illusion, his power of exposing the naked truth before a shocked audience, his corrosive wit, which is a vital produce of extraordinary intellectuality, have led many people to regard him as merely cynical and flippant."

Two of Shaw's utterances in 1910 deserve notice as illustrating his peculiar characteristics of thought. The former was his address before the Eugenics Education Society at Caxton Hall, London, on 4 March. He maintained that to breed the human race with the view to improvement it would be necessary to abolish property and marriage. Property is incompatible with achieving a high level of humanity, he said. He attributed the existence of poverty, ignorance, and idleness to property. And in regard to marriage he said: "It was the experience of almost everybody regarding marriage that, instead of people finding themselves in a great community of marriageable persons of their own age, there were only about three persons within their reach and they did not like any of them. Nevertheless, they had to make the best they could of these three. They were driven into marriage which consequently hardly ever represented their natural impulse, yet natural impulse seemed to be the only thing which is to be trusted for the improvement of the race." He contended that in order to give natural impulse a chance to operate satisfactorily there ought to be a serious effort to make the whole community intermarriageable and to widen the sphere of sexual selection. "Eugenic politics" was what he advocated—the State providing incomes for everybody and seeing that each person earned his income, because mating is now mainly a matter of income. This doctrine led up to his advocating as inevitable the extensive use of the lethal chamber. The State would have to kill off all undesirables. He even entered upon a discussion of the discrimination necessary in selecting the victims, when deciding who are the desirable and who are the undesirable. "Suppose property has been abolished," he concluded, "and the whole community made intermarriageable, and a department of eugenics established. This department in making its experiments might introduce a man to a woman and tell him he was to marry her. The man might object that she had a bad temper and he therefore did not wish to live with her. The department would reply: 'Her temper is the very reason we wish you to marry her. We think a cross of her temper and your temper would produce a highly desirable temperament. It seems to me that to meet cases of

SHIELDS MONUMENT — SHIPPING

that kind we should have to make some provision whereby women can become mothers without having to live domestically with the fathers of their children." This drew applause from the audience, whereupon Shaw said "I notice that immediately I begin to talk immorality I get a response. I am so gratified with that success that I will not try to improve on it but will sit down."

Shaw's other utterance was at a labor demonstration in London on 8 October. He advocated a uniform pension of \$2,500 a year for every person, from birth onward, as a means of abolishing destitution and unemployment. Destitute persons have a legal claim upon the nation for roof and food, and they should have no false shame about accepting the relief. "There is no more dishonor," he said, "in receiving public assistance than attaches to Lord Roberts in receiving his pension."

Shields Monument. A monument erected at the cost of the United States Government, was unveiled over the grave of Brigadier-General James Shields in St. Mary's Cemetery, Carroll County, Mo., 12 Nov. 1910, in the presence of the general's widow, Mrs. Mary Shields, the governors of three States, veterans of the Union and Confederate armies, and men conspicuous in civil and military life. General Shields achieved distinction not only on the battlefields of the Mexican and Civil wars, but in the United States Senate and in the legislative halls of Illinois, Missouri, Minnesota, and South Carolina. He also served a term as state auditor of Illinois and was named the first Territorial Governor of Oregon. General Shields was born in County Tyrone, Ireland, December 1810, and came to the United States when 16 years old. The oration at the unveiling was delivered by Archbishop Glennon. The monument was designed by Jerome Conner, the Washington sculptor, and is of white marble, 11 feet high, surmounted by a bust, 3 feet high, of the dead general.

Ship-Building. See SHIPPING.

Shipping. There were signs during 1910 of a renewed activity by Americans at sea. For more than 60 years the American merchant marine had been steadily decreasing, creating a condition where the increasing American exports were chiefly carried in foreign bottoms. The reason for this was that greater opportunity presented itself for active men in developing the country than in service at sea, and capital found a larger return in other investments. The British assumed supremacy on the sea and there has been of recent years a constant struggle on the part of other nations to secure and hold first rank. But the United States has taken little interest and only the coast-wise trade has remained in its possession. That would undoubtedly have also become foreign if the laws had not forbidden it. It became apparent, however, through investigations of foreign and domestic business combinations, that companies owning vessels plying between American ports and foreign countries had working agreements which made it possible for them to maintain the price of passage and shipping rates, and showing that an American merchant marine was nothing more or less than a commercial necessity.

The true condition of affairs became publicly known 4 Jan. 1911 when United States Attorney Henry A. Wise appeared in the United States

Circuit Court in New York and asked for an injunction restraining the companies operating steamships across the Atlantic from entering or clearing at any port of the United States or its possessions unless they revoked an agreement made 5 Feb. 1908, forming a pool to prevent the reduction of steerage rates. The petition was directed against the largest lines, the Allan, Red Star, American, White Star, Dominion, Anchor, Cunard, Canadian Pacific, British and North Atlantic, North German Lloyd, Hamburg-American, Holland-American, and Russian East Asiatic Lines. The petition alleged that the steerage business was monopolized by the lines in question, and that an agreement had been made to employ no agents who had worked for independent lines. To crush competition the petition alleged that during the spring of 1908 independent vessels which had outfitted and advertised sailings to Russian ports had been compelled to sail at a loss, because the members of the combine had invariably sent one of its ships to fight the independent company, selling tickets at so low a price that the independent vessels were not able to complete. A committee of three men operated the "fighting" ships. The granting of the petition meant the cessation of practically the whole of the great traffic between America and Europe, but called attention to the fact that foreign shipping companies were in a position to injure America's foreign trade.

The first move towards removing this foreign blockade of American ports was the chartering of the *Texas* for the run from New York to Buenos Ayres, providing the first large vessel manned by Americans flying the American flag to take advantage of the growing trade with South America. This trade on the Pacific coast is partly handled by American vessels, but the opening for American capital in the rich territories of Brazil and Argentine had never before created an interest sufficient to cause an embryo steamship line to be formed. The Pan-American Congress held at Buenos Ayres endorsed resolutions introduced by Lewis Nixon, the American delegate, providing for direct commerce relations between all American republics, for the establishment of swift steamship lines and the establishment for such lines the same privileges at ports of call as are enjoyed by the vessels flying the flag of such port.

That more than half the trade of the world was carried in English bottoms was established by the building during 1910 of 560 steamships and 276 sailing vessels, making altogether 37,071 vessels flying the British flag, London remains the greatest of the English ports with 10,373 vessels in and out. In September 1910, the British Government issued a report that showed that during the previous year 134 vessels and 91 steamships had been lost. The commerce of the world during the same period lost 866 vessels of considerable size, according to Lloyd's Register. This does not include thousands of boats under 100 ton register. Ships destroyed or broken up as no longer useful for service totalled a capacity of 939,000 tons. Of these 383 were steamers and 483 sailing vessels. A part of this loss was not from the merchant marine, but was caused by governments in remodeling their navies. Of this number Great Britain destroyed 47 per cent. Of the vessels missing more than half were lost. The average of loss between sailing

SHIPBUILDING



MODEL OF THE "HALF MOON "

The vessel in which Henry Hudson sailed up the river which bears his name

SHIPPING — SHIP SUBSIDIES

vessels and steamers remained equal. Of steamers 53.5 per cent missing from the Register were lost and of sailing vessels 57.5 per cent.

Under the changed conditions on the sea American sailors have largely disappeared. Even the coast-wise sailors are almost altogether foreign-born. The securing of competent crews to man the gradually growing American merchant marine will be not the least of the difficulties. The opening of the Panama Canal will have the effect of greatly increasing American vessels and will probably stimulate the growth of the merchant marine so that the American flag will again be seen in all the ports of the world.

The Merchant Marine Congress held in Washington in Dec. 1910, under the auspices of the National Association of Manufacturers, resolved that some action be taken by the 61st Congress to facilitate the growth of American shipping interests.

Many former advocates of the ship's subsidy plan have more recently bent their energies towards securing a preferential duty which would have the effect not only of building up the American merchant marine but would bring in a revenue. Some of the facts brought out by the supporters of this plan are that American capitalists now own over \$200,000,000 worth of foreign ships, that the American people pay \$300,000,000 a year in freight charges to foreign carriers; and that importations in 1909 of \$1,311,920,224 were only balanced by exportations amounting to \$1,663,011,104, leaving a balance of \$351,090,880 which was practically all paid out in freight charges to foreign ship-owners. It has also been shown that England carries 91 per cent of its own commerce, Germany 55 per cent, France 30 per cent and the United States only 9 per cent. The tonnage of the American vessels engaged in foreign trade is only 861,000 tons, while it takes 5,000,000 tons to handle the commerce. It has also been pointed out that practically no American ships bound for foreign ports will pass through the Panama Canal. During one month on the Suez canal the ships which passed through were: 173 British, 42 German, 16 French, 14 Dutch, 11 Russian, 8 Australian, 7 Italian, 6 Japanese, 6 Turkish, 4 Norwegian, 2 Spanish, 1 Egyptian, 1 Danish, and 1 American.

The advocates of the preferential duty plan point out that a similar plan was followed at the beginning of the republic. In 1789 the first Congress passed a law providing that tariff duties imported on American vessels should be 10 per cent lower. Consequently there was a great impetus in ship-building. Between 1789 and 1796 was a period of great growth, the tonnage in foreign trade increasing from 123,893 tons to 576,733. By 1830 90 per cent of the imports and exports were carried in American bottoms. The condition is now reversed.

Two ocean liners, the *Olympic* and *Europa* were launched in Oct. and Dec. 1910, one with a tonnage of 48,000 tons and the other 50,000 tons. They are the biggest vessels in the world, the *Lusitania* being 45,000 tons. The *Olympic* is 860 feet long and the *Europa* 900 feet. The cost of the *Olympic*, which belongs to the White Star Line, was \$7,500,000. Its rudder weighs 100 tons. Its capacity is 5,000 passengers. It has been possible to eliminate vibration by the use of reciprocating engines in connection with low-pressure turbines. The *Olympic's* speed

will be only 20 knots an hour in comparison with the *Mauretania's* 25 knots, and the horsepower of the engines only 50,000 as compared with the *Mauretania's* 70,000. The *Olympic* has a special ball-room on the ninth deck, a swimming pool and gymnasium. The *Europa* will have all of these accommodations and in addition Turkish baths and every convenience possible in a modern hotel. Its capacity will be greater than any three New York hotels. The building of these two vessels brought out the fact that there were no docks large enough to accommodate them in New York, and renewed interest was aroused in the project to make Montauk Point, at the extreme eastern end of Long Island, into a harbor. This was part of the plan of the Pennsylvania Railroad in securing control of the Long Island Railroad and tunnelling both rivers at New York so that a straight journey could be made from Montauk under New York without stopping. Nothing definite has been done, however, and it will probably be a number of years before the project approaches realization. The harbor to be utilized is Fort Port Bay, just within Montauk Point. There would be a saving of four or five hours of ocean travel.

Ship Subsidies. To insure the establishment of fast American mail and passenger lines to Brazil, Argentina and the Philippines, China, Japan and Australia a bill is now being considered by Congress. It authorizes the Postmaster-General to pay the proposed lines for carrying American mail. The last section of the measure provides "That the total expenditure for foreign mail service in any one year shall not exceed the estimated revenue therefrom for that year." It is expected that the bill, if enacted, would open up South America and the Orient to American commerce to an extent never before known in the history of the United States. It would assure a fortnightly mail and passenger service between this country and Rio Janeiro, another to Buenos Ayres, a third to the West Coast of South America, two from the Pacific Coast to the Orient, and one to Australia. Ships of at least 16 knots speed would be used.

The granting of ship subsidies would not be an unusual departure of the past of the United States government. The first act authorizing postal subventions was that of 3 March 1845. Power was given to the Postmaster-General to make contracts for payments of specified rates on weight of mail carried to foreign ports—24 cents per half ounce for ports 3,000 miles distant; 10 cents per half ounce to Mexico and the West Indies. In 1847 a contract was made with the Ocean Steam Navigation Company for a mail service between New York and Bremen and Havre. The company was to receive \$100,000 for six return voyages to Bremen per year, and \$75,000 for six voyages to Havre. In 1850, the Collins Line, plying to Liverpool, agreed to accept \$19,250 per voyage, making 20 voyages a year. A number of similar contracts were made about the same time, but in 1858 the granting of mail subventions was abandoned, and vessels carrying the mails were allowed only the sea postage plus the inland postage on mails carried. Postal subventions were allowed to lines running between New York and Rio de Janeiro, and between the Pacific coast and China, but were discontinued in 1875 after running 19 years. In 1891 a law was enacted authorizing the

SHIP SUBSIDIES — SIAM

Postmaster-General to make contracts with American shipowners for carrying the mails between America and foreign ports. Steamships were placed in four classes: iron and steel vessels of not less than 8,000 tons with a speed of 20 knots per hour; iron and steel vessels of not less than 5,000 tons, with a speed of 16 knots; iron and steel ships of not less than 2,500 tons and a speed of 14 knots; iron, steel, and wooden ships of not less than 1,500 tons and a speed of 12 knots. This law is still in force. The most that may be paid for carrying the mails is \$4, \$2, \$1, and 60c per mile sailed for the respective classes. The requirement is that contracts be let to the lowest bidder.

In spite of the persistent agitation of the shipping interests a general objection to all ship subsidies has prevailed in this country. It has been pointed out that American shipping on the high seas is constantly declining. In 1905 the total tonnage of the United States engaged in foreign trade was only 943,750 as contrasted with 2,496,894 tons in 1861, while the tonnage of foreign nations has constantly increased. Without government subsidies it has been contended that the costs of construction and operation are heavier in America than elsewhere. Since 1840 the United Kingdom has granted liberal subventions for carrying the mails, while in America no action has been taken, though bills for granting subsidies have for the last 10 years been constantly before Congress. Government aid is granted to a small proportion of German shipping. In France, subsidies are paid in the form of both construction and navigation bounties. In spite, however, of the liberal payments in aid of French shipping, the industry is far from prosperous. The French mercantile marine has a tonnage of about 1,250,000, of which 650,000 consists of sailing vessels, a large part of which would not be operated at all were it not to obtain the subsidies. Germany, on the other hand, has a merchant shipping tonnage of 2,400,000, though it pays no general subsidies. The Italian government, also, has paid both operation and construction subsidies since 1886. A similar policy was adopted by Japan in 1896, and by Austria-Hungary in 1893. Other countries, however, which have granted subsidies, show an increase in tonnage fully equal to that in the case of these three latter nations.

It seems probable now that the movement in favor of the granting of subsidies to United States shipping will succeed in its purpose. The immediate cause of the administration's decision to act has been the threat of the foreign steamship lines to raise their freight rates between this country and other parts of the world. The need for a better freight and passenger service between the United States and South America is so apparent that action cannot long be delayed. At his inauguration, Marshal da Fonseca, the new President of Brazil, said: "There is much to be done to foster and develop trade between the United States and Brazil. One crying necessity is an adequate cargo-boat and passenger-ship service. It is high time some American company took this matter in hand and gave us fast, up-to-date transport facilities, lack of which at present hinders the growth of trade. Establishment of such lines would give immense impetus to commercial relations between Brazil and the United States." This, it is now agreed, applies likewise to other South American countries.

Senator Frye introduced in Dec. 1910 a short measure in Congress giving American ships the advantage in the use of the Panama Canal. The bill provided that the toll charges of all ships of the United States and all merchant ships of American registry in the canal should be paid out of the United States Treasury. This is a form of subsidy for the benefit of American ships only.

Short Ballot. See **BALLOT, SHORT**

Siam. A kingdom in southeastern Asia, adjoining French Indo-China

Area and Population.—The frontier-line between Siam and Burmah was fixed in 1891, and by the Anglo-French Convention of April 1904, English and French boundaries were declared, Menam and the Gulf of Siam dividing the territories of the two countries. In the years 1904 and 1907 tracts of country were acquired by France, increasing the territory of Cambodia 7,000 square miles. Certain concessions were made Siam in the Laos region, in 1907. Moreover, Britain brought about a profitable agreement at Bangkok in 1909, securing 15,000 square miles of country, with 450,000 inhabitants. In like manner, lines of delimitation have been and keep changing, the kingdom losing something each time. However, the present area is estimated at 200,000 square miles, and the population at about 6,250,000. The chief town and port is Bangkok, with more than 628,000 inhabitants. Puket has a population of about 180,000. France controls four ports on the Mekong.

Government, etc.—There is a Legislative Council in the Government, and it has been quite active in its office. The Council was created specifically for the purpose of perfecting the laws of the country; at present it consists of 41 members (at no time less than 12), and meets once a week. The Ministry, who, with the King, form the executive authority of the land, are members of the Legislative Council. For administrative purposes the kingdom has been divided into 18 districts, under the political supervision of high commissioners named by the King. The Malays of Siam are more or less independent and self-governing, but long strides have been taken by the King and his ministers in systematizing the government of the entire realm; insufficiency of officials qualified as overseers has been a serious handicap, however. A number of Europeans and Japanese are functionaries under the Government, and the King's chief advisor is a European. The King is quite an absolute monarch, notwithstanding foreign intervention in his affairs, and appoints of his own successor.

Finance, Banks, and Public Institutions.—The estimated receipts of the Government for 1909-10 were \$22,750,000, and the expenditure about \$22,724,300. In 1908-09 the revenue was derived chiefly as follows: opium tax, \$5,025,000; spirit tax, \$1,570,000; gambling, \$2,425,000; land and fisheries, \$3,130,000; customs, \$1,955,000; forests and mines, \$905,000; posts, telegraphs, and railways, \$1,930,000. The country pays 4 per cent interest on a loan of \$20,000,000, contracted for railway construction. The Hong Kong and Shanghai Bank, the Bank of India, and the Bank of Indo-China, have branches at the capital. There is also a native bank. Government currency has superseded the bank currency. In 1907 the value of \$5,323,000 was

in circulation. The work of the interior has been and is receiving the attention of the Minister in charge. court-house, goals, etc., are being rapidly established throughout the country.

Education and Religion—There are 61 elementary schools, with 5,000 pupils, (one being English, with 100 pupils), 1 English school for secondary instruction, and 1 residential English school, with 65 pupils. Six secondary schools, teaching English, have an enrollment of 830. There are four primary educational establishments for girls, with 350 pupils, besides 2 teachers' colleges, 1 Civil Service institution, and military, naval, etc., colleges. The Minister of Worship and Education has the supervision of a museum and several hospitals in the capital. Buddhism is the faith of most of the inhabitants. There are 88,000 priests in the native temples (10,000 in number) where 54,000 pupils are instructed in paganism.

Industries—Rice is the principal product of the soil. Pepper, coffee, and fruits of many kinds are cultivated. The dense forests contain rubber-trees; rubber is now being cultivated. Cattle-raising is an important industry, as is the working of teak. English officers from India look after the cutting of the forests. The mineral wealth of Siam is great. Gold, tin, coal, iron, zinc, manganese, antimony, copper, and precious stones exist. There is a French gold-mine and a Danish copper-mine, and tin is largely worked. Rice provides food and work for a great number of people; there are 60 rice mills. Labor is dear in Siam. A poll tax has been introduced in the country; and the abolition of slavery for bond-people born after 1897 has been decreed.

Imports and Exports.—Imports into Siam consist chiefly of treasure, cotton goods, food-stuffs, gunny bags, oil, sugar, opium, metals, and iron work, silks, etc., etc. In 1909-10 rice constituted more than four-fifths of the total exports. Teak, hides, and ocean-products are the other important articles of exportation. Over-sea imports in 1909-10 amounted to the value of \$25,735,100, and the exports to \$37,810,500. The leading articles of trade for 1908-09 and their respective values were about as follows: cotton goods, imports \$5,175,000; iron and metal-work, \$1,675,000; silk goods, \$1,455,000; gunny bags, \$1,105,000; sugar, \$955,000; and kerosene, \$740,000. Exports: rice, \$29,875,000; teak, \$4,435,000; ocean-products, \$850,000; treasure, \$266,000; and hides, \$410,000. The preponderance of trade is with Singapore, Hong Kong, Great Britain, Germany, and Holland.

Shipping, Railways, Posts, and Telegraphs.—Shipping represented in vessels entering and leaving the ports of Siam is Norwegian, more than 800 vessels entered at the ports in 1908. German, Japanese, and British vessels carry a portion of the trade. The State owns most of the railways, of which there are about 650 miles open. Bangkok is in railway communication with Petchaburi and with Korat, distances of about 100 miles and 165 miles, respectively. Lines are being constructed in the Malay Peninsula, in the northern part of Siam, and to the east, in the direction of Petrii. A postal service is being established in the country, existing already in the capital, and connecting with the international system at Singapore. Mail is carried, also, down through the Malay ter-

ritory. There are about 3,000 miles of telegraphs lines, putting Bangkok in communication with the interior, and with various exterior points, with Tavoy in Burma, for instance, and with Saigon, in Anam.

History, 1910—Chulalongkorn I, King of Siam, died 23 Oct 1910, and was succeeded by his son, Chulalongkorn II, Vajiravudh, who was 30 years old at that time. He was educated at Harrow in England, and learned military tactics at Sandhurst, Aldershot, and Potsdam.

Siam, which is not quite as large as the State of Texas, is nominally independent, but has been practically under the protectorate of France and Great Britain since the Anglo-French convention in 1904. It is thickly populated and in recent years has been peaceful and prosperous, chiefly because the King, whose rule was absolute, delegated a large portion of his authority to his two advisers, Dr J. W. Westingard and Prof. Edward Henry Strobel, both of the Harvard Law School. Education for the first time was introduced under the reign of Chulalongkorn, who also built a navy and railroads.

The full name of the late King was Somdet Phra Paramind-Maha-Chulalongkorn-Chulachom-Klao. He was one of the 43 sons of Maha-Mongkut, and was born in Bangkok, 22 Sept. 1853. His reign covered 40 years. During that time he remodeled his government as nearly as practicable along European lines, introducing a Cabinet Council of six royal princes and thirteen ministers of State. The navy of 26 vessels he placed under the command of Danish officers. He visited America and went to Europe several times.

The ceremony of allegiance when the new King ascended the throne, consisted of drinking a water, prepared for the occasion by being stirred with spears, swords, and pistols. By it he was proclaimed absolute ruler, the language allowing for no differentiation between "God" and "King." He was specially educated by his father, however, to carry out a progressive policy of educational and economic revolution. These policies inaugurated by his father include practical abolishment of slavery, cessation of all internal taxation which has proved unpopular, opening of new canals for irrigation and transportation, the construction of new railroad lines, the development of internal commerce, the perfection of the postal system, the extension of the telegraph, and the development of the lighthouse and coast survey. The late King had already declared religious freedom and established a new and more equitable code of laws.

Siberia. See RUSSIA

Sierre Leone. See BRITISH WEST AFRICA

Sillon Movement. See CATHOLIC CHURCH.

Siloxicon is the name of a refractory material produced from silicon, oxygen, and carbon. Its typical chemical formula is Si_2O_2 . The process of its manufacture was patented by Edward G. Acheson, its inventor, in March 1903.

Silver. See METALS

Silver Fox. See GAME FARMING.

Simon, John Allsebrook. English jurist: b 28 Feb. 1873. The son of a Congregational

minister at Bath, he went to Oxford with the aid of a scholarship became president of the Oxford Union, took a brilliant degree, and at the age of 37, when it is rare for a man of exceptional ability to secure the patent of a King's counsel, he was made one of the law officers of the Crown. As solicitor-general he is the colleague of the attorney-general, with power to act in the latter's absence, and with the prescriptive right of succeeding to his office in the event of a vacancy. The nature of his office is the same, in a lesser degree, as that of the attorney-general. The functions of an English attorney-general differ considerably from those of the American. Although a member of the ministry, he is never a member of the cabinet, and has therefore no direct share in determining the policy of the administration and no responsibility for the conduct of a department. He is in no sense a minister of justice. Even as legal adviser to the prime minister and cabinet, his work differs in one important respect from that of the attorney-general of the United States; for, owing to the difference in the political systems of the two countries, he has not the great responsibility of providing the chief executive with an expert opinion on difficulties arising from the necessity of conforming to a written constitution and from the possibility of clashing between Federal and State powers. The advice he gives to the prime minister is confidential. He takes precedence of all other pleaders at the bar, and appears in all legal proceedings in which the interests of the Crown are at stake. The attorney-general has parliamentary functions also. He sits on the front bench at each day's sessions, ready to give help to his party in important debates, like any other member of the ministry, and gives special assistance to the government in the committee stage of its principal measures. Not many years ago the attorney-general and solicitor-general were commissioners of patents, and derived their income largely from fees paid by inventors. They now receive a fixed salary of \$35,000 and \$30,000 respectively, in addition to the fees of any litigious business they may conduct in behalf of the Crown. This latter item may amount to from \$15,000 to \$30,000 a year in either case. They are debarred from private practice while in office.

Simplified Spelling. The object is to enable the English language to be more easily acquired and used. Advocates of simplified spelling urge that our language is handicapped by intricate and disordered spelling. We are wasting millions of dollars and efforts worth millions more in printing, typewriting, and writing useless letters forming part of our present spelling. Simplified spelling seeks to do away with this at a single stroke. It aims to do so gradually. As a result of the simplification, our spelling will aid the spread of English, with attendant advancement of commerce, of democratic ideals, and of political and intellectual freedom, economize the time of our school children, make their work more efficient, and greatly aid in the cheapening of printing.

The rules and analogies which underlie English spelling at the present time can be ascertained and stated and the exceptions clearly seen. The object of simplified spelling is to reduce or abolish the exceptions. For the

furtherance of this purpose, a simplified spelling board with offices at No. 1 Madison avenue, New York, was organized in Jan 1906. The first list put out was made up of 300 common words spelled in two or more ways. It was stated at the time that the list could be expanded to 600 or 900. There were 40 distinguishable classes of words. The classes included, arranged in the alphabetical order of the letters or affixes affected, were. (1) words spelled with *ae* or *æ* or *e*. Rule: choose *e*. Example, Anesthetic, esthetic, medieval, etc.; (2) words spelled with *-dge* or *-dg*. Rule: omit *e*. Example, abridgment, acknowledgment, judgment, lodgment; (3) words spelled with *-ed* or *-t*, the preceding simple consonant doubled before *ed* (*-pped*, *-ssed*) and left single before *-t* (*-pt-st*). Rule: choose *-t* in all cases. Example, clipt, dript, dropt, stept, etc. Forms like these being inflections are commonly omitted in the dictionary lists of words spelled in two or more ways, but they are genuine, historic spellings and cannot be ignored. The first 300 words marked the effort of President Roosevelt to introduce simplified spelling in the Government service.

A second list was put out on 30 Jan. 1908. It contained (1) a miscellaneous list of 75 words representing various anomalies, and six classified lists coming under the two general rules covering the words in: 1-ile simplified to *il*, 2-ine simplified to *in*, 3-ise simplified to *-is*, 4-ite simplified to *-it*, 5-ive simplified to *iv*, and 6-ed-pronounced *t*, simplified to *-t*. A third list, published 25 Jan 1909, contains four additional classes. There are (1) words having *ea* pronounced *-e* and so simplified, as in *hed*, *helth*, *spred*, etc.; (2) preterits and participles ending in *-ed* pronounced *-d* and so simplified, as in *armd*, *burnd*, *fild*, *lvd*; (3) words ending in syllable-*ice* pronounced *-is* and so simplified, as in *coppis*, *cornic*, *crevis*, *justis*, etc.; (4) words ending in *-ve* pronounced *-v* and so simplified, preceded by *l* or *r*, as in *delv*, *solv*, *corv*, *serv*, etc.

The entire alphabetical list published by the Simplified Spelling Board in its Circular No. 23 contains 1,100 separate words, simplified in the root, and 2,200 inflected forms (preterits, participles, and participial adjectives ending *-ed* or as simplified in *-d-t*) in which the change appears only in the inflection.

Sinclair, Upton. American author: b. Baltimore, Md., 20 Sept. 1878; A.B., College of the City of New York (1897), graduate work four years at Columbia University. Ever since the appearance of Mr Sinclair's world-stirring novel attacking the Chicago meat packers, 'The Jungle,' he has become more and more attached in word and deed to the principle and party of socialism. 'Samuel the Seeker,' (1910) is an exposition of his views, no doubt, of the experience of many a man searching for a political creed that will stand the acid test. 'Starving for Health's Sake' (1910), a unique series of articles on gaining and keeping health, showed another avenue of the author's wide range of inquiry.

Sinn Fein. The title and expression of a society which denies the lawful existence of the incorporate union between England and Ireland, and aims at the development of the latter country by movements originating from within Ireland. The term is Gaelic and means

SISTERS OF CHARITY CENTENNIAL—SLAVERY

literally "Ourselves" The society is an outgrowth of the Gaelic League and, like it, has attracted a large proportion of talented youth both in Ireland and America. It strives to do in the political and industrial field what the Gaelic League is doing in reviving the literature and customs of Ireland. It has worked for the introduction of a protective system for Irish industries and commerce and for the establishment of banks, councils, a mercantile marine, a National system of insurance, and for the abolition of the poorhouse system. Branches exist in England, Ireland, and America, the total membership in 1910 reaching 190,000. Several papers are published by the Society, the chief being *Sinn Féin*, and a number of books have also been issued. The New York branch is at 224 East 62d street, where lectures are delivered fortnightly.

Sisters of Charity Centennial. Roman Catholic Churches in New York City celebrated on 1 and 2 Dec. 1909 the one hundredth anniversary of the founding of the Sisters of Charity in the United States. The services were of a solemnity and splendor in keeping with the occasion. A solemn pontifical mass was celebrated in St. Patrick's Cathedral by Archbishop Farley, of New York, as a beginning of the ceremonies. The preacher on this occasion was Mgr. James H. McGean, rector of St. Peter's Church. The children of the Catholic schools took a prominent part, twelve hundred of them singing the processional and recessional hymns of the pontifical mass. 1 December was declared a holiday for all school children by the Catholic School Board, while on 2 December a mass was held at every church of the diocese, at which the children of each parish were present. For the service at the Cathedral invitations were sent to all the bishops of the province, most of them attending and assisting in making the ceremonies among the most noteworthy religious happenings during 1909. The attendance of the clergy and laity was also large and imposing, all those who were in any way connected with the schools, academies, hospitals, and orphanages under the care of the Sisters of Charity being present.

The Sisters of Charity were founded in the United States in 1809 by Elizabeth Anne Bayley Seton, a convert to the Roman Catholic faith. She was born in 1774, marrying William Seton, a New York merchant in 1803. It was two years after this she embraced Catholicism. This step on her part excited such bitter disapproval from her kin and friends that she removed to Baltimore, Md., where she opened a private school, and was afforded an opportunity of pursuing her religious beliefs unmolested. The latter continued to occupy her more and more completely until 1809 she chose to formally consecrate herself by vows to a religious life, Archbishop Carroll, of Baltimore being present at her profession. Almost immediately other devout women followed her example, and these, with "Mother Seton" at their head, soon formed a little community patterned after the Sisters of Charity founded by St. Vincent de Paul in France in 1633, and adopting the same title. It was in this fashion that the work which has since assumed such immense proportions had its inception. At the time, Mother Seton expected to have a colony of

sisters sent from Paris to assist her in the work of organization at the first home, which was located at Emmetsburg, Md. The political troubles of Napoleon prevented this, however, but the constitution of the French order was nevertheless adopted without change. Up to 1809 there had been no permanent community in the United States devoted to the education of young girls, but this work Mother Seton promptly undertook, her efforts in this direction being so striking that in 1817, upon application of Bishop Connolly, she sent her first band of sisters to New York. She died in 1821, but by that time her work had begun to bear fruit. Embossed medals, bearing Mother Seton's portrait and a brief appreciation of her achievements, were distributed at the 1909 centennial.

Six-O-Six. See SYPHILIS, NEW CURE FOR.
Ski Jumping. See SPORTS.

Skin Diphtheria. A series of remarkable cures of diphtheria of the skin were effected at St. James' Hospital, London, during the year 1910 by the use of a diphtheria antitoxin. Skin diphtheria, which is really an impetiginous eczema caused by diphtheria bacilli, was, prior to the perfection of the present system of treatment, one of the most intractable of all skin diseases. Under this new antitoxin treatment, however, it has been found that the worst cases of skin diphtheria can usually be cured in about a week. This discovery is, therefore, one of decided medical importance.

Slavery. The charge was made in Aug. 1910, that a gross system of slavery, of dealings in human beings, was in operation in Hongkong and the Straits Settlements, and that it was worked under the protection of the British flag. The business, it was alleged, became so flagrant that it came to be known as the "chu-chai" trade—"chu-chai" being the Chinese for pig. The trade is among Chinese coolies who are wanted on the rubber plantations of Malasia. Malays, Javanese, and Indians are unable to bear the labor. Good Chinese coolies fetch a high price to the men who deal in them. During six months in 1910 more than 30,000 male adult Chinese were obtained in Hongkong and the neighboring provinces, and lured away and sold into bondage under British institutions. Many, discovering on the way the fate that was awaiting them, threw themselves from ships into the sea. It was said that the conditions of the coolies in bondage were revolting. But the British slave dealers and rubber growers were making immense fortunes out of this chu-chai trade. So nothing was said. "On the plantations," wrote the *World* correspondent, "the coolies are housed in horrible quarters inclosed in high barbed wire fences. Into these compounds the unhappy men are driven at night like pigs and from them they are driven out to work at sunrise. Throughout the civilized world an outcry was raised at the abuses of the natives on the rubber plantations in the Congo. No-where was the outcry louder than in England. The missionaries are silent here as they were there. But it needs no imagination to realize the gross abuses that take place in Malasia." At work at night, according to the same witness, the Chinese coolies, penned in as helpless slaves on these rubber estates in the Straits Settle-

ments, have to be watched by armed guards lest they should set fire to the buildings or destroy the rubber trees. Their pay is five cents a day—less than two and a half cents in American money. They are fed and clothed by their owners—and the feeding and the clothing are upon even a worse scale than the pay. The coolies are at the point of revolt all the time, and are kept down only by armed force. Appeal to the British authorities has been futile, for the law only hands them back to their bondage.

Some discussion has also been aroused by the allegations of continued slavery in the Portugal isle of San Thomé. According to the story in a Lisbon daily of a Portuguese merchant just returned from San Thome, where he lived two years, the negroes live packed in hundreds like animals, their foods consist of rice and fish, the latter often in a high state of putrefaction; they are never repatriated and generally perish from excessive work. They are constantly flogged with whips made of the hide of hippopotamus, which inflicts severe wounds. When the natives get too old to work and do not die as the result of this treatment they are poisoned. The story caused much comment in Lisbon. The *Seculo* said it had received information that only 34 natives were recruited in Mozambique for San Thome for sometime, the great bulk of them refusing to go to the Portuguese plantations, and preferring to engage themselves for work in the Rand mines.

Slave Traffic, White. See WHITE SLAVE TRAFFIC

Sleeping Sickness. This disease, the cause of which was not definitely ascertained until 1901, is chiefly prevalent in South Africa. One of the typical symptoms of the advanced stages of the disease is continued drowsiness. The drowsiness increases progressively, and the habitual attitude becomes characteristic; the head is bent on the breast; the eyelids are closed; in earlier stages the invalid can be aroused easily, but, after a time, incurable attacks of sleep overcome the patient in all circumstances, but especially after meals. These fits of sleepiness become longer and deeper, until the patient reaches a comatose condition from which it is almost impossible to arouse him.

This, however, is characteristic only of the later stages of the disease. At first, no symptoms are noted; and the patient may go for years without the least sign of the disease becoming manifest. The virus is in his blood, nevertheless; hence the insidious nature of the disease. It is essentially a disturbance of the brain. A long time—perhaps years—after infection, the first symptoms show themselves. There is a slight change in demeanor, the patient lies about, and shows disinclination for all effort. The face becomes dull-eyed, heavy, and apathetic. The voice is thin, the pulse weak and tremulous. The temperature gradually falls as the vital powers become exhausted.

The sleeping sickness occurs very extensively in Congo Free State; and was probably imported thence into British Uganda, when Emil Pasha and 10,000 of his followers settled in Basutoland. Thenceforth the disease spread rapidly. The natives are the chief sufferers from the disease; and some idea

of the extent to which they succumb to it may be derived from the fact that, in 1901, the island of Buvuma in the north of Lake Victoria Nyanza had a population of 22,000, in 1903, it was 8,000.

The first thing that had to be done was to isolate the germ, if such it was, and study it. The medical corps under the direction of Sir David Bruce finally succeeded in doing this. Under a high-powered microscope, an active wiggling parasite was discovered, since known by the name of trypanosome. It is a one-celled creature, belonging to the lowest forms of animal life. It is worm-like in shape, and capable of swimming with equal facility in either direction. It was found that this parasite infected the brain of those affected, causing the symptoms witnessed in this disease.

Subsequent inquiry showed that this parasite is conveyed from one individual to another by means of the tsetse fly, which bites the individual, and spreads the infection in that manner. As soon as this was definitely ascertained, measures were taken at once to stamp out this pest, by poisoning the breeding pools, and by other means. The result is that a great decrease in recorded deaths has been noticed, and there is every reason to hope that, in time, this scourge will be stamped out altogether. There are still, however, many cases of the sickness; and it is probable that cases will continue to develop for some years even after the fly has been virtually abolished,—owing to the fact that the infection takes a great length of time to develop, and many, now infected, will not show the effects for some years to come.

Sleep, Theories of. For a number of years past, controversies as to the nature of sleep have been in progress. Chemical, histological, physical, and psychological theories have been advanced; but none of them has been universally accepted, and none of them can be said to explain all the facts. It is generally conceded that a diminished blood supply is noticed in the brain during sleep; and thus, Professor Mosso, of Turin, claimed to have proved experimentally. Only lately, however, Prof. R. M. Wenley, of the University of Michigan, has stated that he has demonstrated this to be incorrect; and that a lessened flow of blood is noted in the brain, in deep sleep. Details of his experiments have so far not been published, and it is impossible to say, at this date, what degree of certitude has been reached by his experiments.

Three new theories of sleep have been advanced within the past few years. These may be enumerated in turn.

(1) The theory of cell-exhaustion and the inhibition of sensory stimuli. As the result of a number of experiments on the lower animals, and on children, it was found that sleep soon supervened whenever all sensory stimuli had been cut off for any appreciable length of time—until the former excitations had died down. From this Dr. Boris Sidis concluded that, in these cases, sleep ensued immediately upon the cessation of stimuli, and that the waking state was directly dependent upon them. He says ('An Experimental Study of Sleep'): "We regard sleep as a reaction of protoplasm, and as such we may express it in terms of neuron threshold and neuron energy liberation. As the cell or the neuron keeps

reacting to stimulations, the disposable physiological energy becomes lowered, and there is greater economy in the liberation of cellular or of neuron energy. The cell or neuron does not respond to the same intensity of stimulus with the same amount of energy. In other words, the threshold rises. Should the stimulation keep on acting without variation, both as to quantity and quality, the threshold rises so high that the stimulus can no longer step over the threshold, and can no longer call for any reaction in the cell. We say that the cell or the neuron is fatigued or exhausted. Really, this is not so much due to the exhaustion of the cell as to the exhaustion of the stimulus—it is the stimulus that has exhausted itself. Vary the stimulus in quantity or in quality and the cell or neuron reacts once more. We may best describe this general physiological fact of cellular reaction by the term stimulus exhaustion. . . Sleep is produced by monotony. . . Stimuli which have exhausted themselves by their monotony drop out and are replaced by new ones until the whole round of stimuli is gone through, and the organism ceases to respond to its external environment—it falls asleep. Sleep is not pathological, it is essentially physiological in character."

(2) The second theory is one based upon a revised form of the vitalistic hypothesis, and is contained in Mr Hereward Carrington's 'Vitality, Fasting and Nutrition.' He compares the human body to an electric motor (instead of a steam engine) and contends that energy "flows into" the body, through the nervous system, in some inscrutable way, during the hours of rest and sleep. He says:

"Sleep is that physiological condition of the organism in which the nervous system of the individual (in precisely the same manner as the electric storage battery) is being recharged from without, by the external, all-pervading, cosmic energy, in which we are bathed, and in which we live and move and have our being." On this theory, sleep would be the restorer of energy; and food would merely serve to keep in repair the organism through which the 'cosmic energy' manifested.

(3) There is the recent biological theory of sleep, advanced by E Claparède. According to him, sleep is not due to fatigue, because fatigue frequently produces insomnia. Sleep is a negative state, a cessation of all activity. It is a reaction of defence to protect the organism against fatigue, rather than a psychological process, the result of fatigue. It is an instinct; we sleep not because our nervous system is poisoned or exhausted, but because we cannot help sleeping. He believes that sleep did not always exist; but is a product of evolution.

In opposition to this view, the author of the vitalistic theory, above mentioned, pointed out that sleep is far from being a negative condition, but is at all times a very positive one, in certain respects,—one in which active changes, repair of tissue, restoration, etc, proceed rapidly. The caterpillar becomes the butterfly during its period of incubation within the cocoon, and many other wonderful changes take place. At present it cannot be said that there is any theory of sleep that has gained wide acceptance; but that, in spite of the recent theories and the amount of work that has

been expended upon this question, it still remains a mystery as to its innermost nature.

Sloan, Richard E., American politician: b. Preble County, Ohio, 22 June 1857. He was graduated from Monmouth College A.B. 1877, A.M. 1889, and from the Cincinnati Law School LL.B. 1884. He also received the honorary degree of LL.D. from Monmouth College in 1906. He was admitted to the bar in 1884, and practiced at Phoenix and Florence, Arizona, 1884-89. He was elected an associate justice of the Supreme Court of Arizona in 1889, serving until 1894, and reelected in 1897 for the term expiring in Nov. 1906. On 1 Sept 1908 was elected, on the Republican ticket, Governor of Arizona, as successor to Gov J.S. Little for the term expiring 13 Feb 1913, taking his seat in Jan. 1909.

Smith, Charles Sprague, American educator, lecturer and author: b. Andover, Mass., 27 April 1853, d. 30 March 1910. He was graduated from Amherst in 1875, and spent five years in study abroad; on his return to this country he became instructor in modern languages at Columbia, and later professor of Romance languages and literatures, resigning in 1891 to devote himself to more general work of organization and lecturing. In 1895 he organized the Comparative Literature Society, and in 1897 established and became managing director of the People's Institute, which, under his leadership, became a power for wisely directing the opinions of the clientele of Cooper Institute. He was author of 'Barbizon Days' (1902); and 'Working with the People' (1904).

Smith, Francis Hopkinson, American artist and author: b. Baltimore, Md., 23 Oct 1838; son of Francis Hopkinson and Susan (Teackle) Smith; educated as mechanical engineer; (L.H.D. Yale, 1907). 'Peter' (1909) has been pronounced Mr Smith's most genial, if not finest, story. Peter is a character that will live in the literature of America. The story is one of love, life and business of to-day with Peter ever shining in its midst, inimitable, with his wisdom and charm making him the most lovable of men. 'Kennedy Square' began serially in the November (1910) *Scribner's Magazine*. It is a story of the old South; delightfully rich in its humor and tender in sentiment.

Smith, Goldwin, English educator and author: b. 23 Aug 1823; d. 7 June 1910. With a preparatory education at Eton, he was graduated from Magdalen College, Oxford University, in 1845, having won two scholarships and many prizes. In 1847 he was made a fellow of University College, Oxford, and, the same year, was called to the English bar. From 1858 to 1866 he was Regius professor of history at Oxford. King Edward VII as a youth was one of his pupils. At the outbreak of the Civil War he became an ardent champion, in England, of the North. In 1864 he visited the United States, and returned in 1868 to reside and lecture in this country. Later he was honorary professor of English and constitutional history at Cornell University. After 1871 he lived in Toronto, Canada. He was a member of many learned societies, and a prolific author of books, pamphlets, and articles in magazines and newspapers on a great variety of subjects of public interest. His recollections of England dated back to George IV, as he had lived through

reigns of five English Sovereigns. Referring to his early days he said: "I have talked to Addington about Pitt—Addington who was Premier of England in 1801. I remember the rejoicing in England over the reform bill. I remember seeing the farm buildings near my father's house burned by raiders who opposed the introduction of threshing machines. I recall as a lad seeing the servants light the fire with a tinder box. I have seen a man in the stocks. I have heard the curfew." He believed that the ultimate destiny of Canada was union with the United States. He did not especially praise our form of government, and ascribed to commercial greed the taking over of the Philippines by this country. His latest published works include 'Commonwealth or Empire' (1902); 'In the Court of History' (1902); 'The Founder of Christendom' (1903); 'Lines of Religious Inquiry' (1904); 'My Memory of Gladstone' (1904); 'Irish History and the Irish Question' (1905); 'Labour and Capital' (1907).

Smithsonian Institution, Development of the. The skins and mounted figures sent to this Institution by the African expedition which was headed by Col Theodore Roosevelt have served to draw attention to the great progress and development which the Institution has made since its establishment in 1864. Among the recent acquisitions of note is a valuable collection of American mammals, presented by Mrs. E. H. Harriman, who has provided a fund to be used in the study of American Mammals by Dr C. Hart Merriam of the Agricultural Department. Late in 1910 plans were laid for a surveying party from the Smithsonian to go to the Canal Zone under the joint cooperation of the Departments of War and Navy and Agriculture to conduct a biological survey of the Zone. Charles L. Freer has increased his donations to the art section with objects of rare value and interest from the interior of China.

These additions are typical of the Institution's development, which has been constant since Joseph Henry, who was its first secretary, constructed the world's earliest electrical magnetic telegraph, since the first weather map which was ever published was issued by this Institution; and since the groundwork of the present science of fish culture was laid here by Spencer F. Baird. Professor Langley, who, like Henry and Baird, was one of the early secretaries of the Institution, built an aerodrome and tried to fly it at Wide Water on the Potomac River. He learned from his experience lessons in construction and operation which are the basis of aeronautic science. He also invented the balometer, a delicate instrument which registers the hundred-millionth part of a degree of temperature. It is constructed in part of a spider's web, the gauze of a fly's wing, a mirror as small as a pin head, and a thread of spun glass. It is sensitive to the heat thrown from a star, and is used in studying the constancy of the sun's heat,—a work in which Professor Abbott, who received the bequest of Professor Langley's investigations, is now engaged, as director of the astrophysical observatory, in an effort to accurately forecast the weather.

The songs, customs and traditions of the Indians are preserved in the Bureau of Eth-

nology, and handbooks on these subjects are being published. The National Zoological Park at Washington, which is part of the Institution, has been enriched by collections of wild animals from every continent and every country. The National Museum has become one of the finest museums for scientific research in the world. The division of economic geology contains more than a half-million different exhibits, and holds the world's first rank among all exhibits of this kind. Here are the skeletons of extinct animals, sea shells, birds, insects, bugs, and, most interesting of all from a human standpoint, the anthropological exhibits illustrating the progress of various races from their beginnings. The development of all the most important arts and sciences is also shown, such as shipbuilding and printing, from the earliest to the most modern inventions.

The International Exchange Service of the Institution, for the free interchange of governmental scientific publications between this and other governments and between American and foreign private investigators, keeps in close touch with scientific progress in all parts of the world. The foreign publications received have enriched the Library of Congress. Fifty-three full sets and 30 partial sets of all official publications of the United States, which are of special value to students of economic conditions, are being sent to other countries. The International Catalogue of scientific literature, for the preparation of a classified index to the current scientific literature of the United States, is another growing department of the Institution. This catalogue is a classified author and subject catalogue of all original scientific papers published throughout the world since 1900. There is a regional bureau in every principal country which indexes the scientific literature of that country. All of these regional indexes are delivered to the central bureau in London, where they are assembled, edited, and published annually in seventeen volumes. The cost of printing and publishing is met by the sale of the catalogue. Every scientific journal in the world is examined and a record made of each article. This catalogue, beginning with 1900, will be a complete index of all the scientific thought of the world during the years covered by it. As it is to be a perpetual catalogue the scientists of the future will be able to take advantage of all scientific information that accumulates from the beginning of the century.

Reports of the work of the Institution are published and placed in the principal libraries of this country. The regular report, and the 'Smithsonian Contributions To Knowledge' are issued annually, the latter in several volumes. 'The Smithsonian Miscellaneous Collections' covers every scientific subject with which the Institution is concerned. The work of the Institution is maintained from contributed funds and congressional appropriations.

Smokeless Powder. See EXPLOSIVES.

Smuggling. Actual smuggling, except on the persons or among the effects of returning travellers has not been successfully practiced in the United States, but is very common in Europe due to the Government monopolies on such commodities as sugar, salt, and tobacco. All European frontiers are carefully guarded against smugglers, and in many districts almost continuous warfare is carried on between the

SNAKE BITES AND POISONS

inhabitants and the customs officials. This is true particularly of the northern border of Italy where the many mountain defiles make smuggling by way of Switzerland comparatively easy.

In the arrest of Marquis Gino Capponi, a member of an ancient Florentine family at Varese one of the boldest bands of smugglers of modern times was broken up during 1910. Although a man past 50 when he lost his fortune he organized his band of smugglers with ramifications in many Italian towns and commenced operations over the Swiss and Austrian frontier. For many months the authorities were unable to cope with his men and he succeeded in bringing in large quantities of contraband tobacco, lace, watches, coffee, sugar, and saccharine. Gathering the goods at large centres from which merchandise was constantly sent by parcels post they utilized this same means of deceiving the Government agents and were able to realize large amounts by selling to agents in every section of Italy.

To meet this sudden increase in the crime the customs service was doubled along the frontier and hidden wires with alarm bells were stretched across every footpath leading out of the mountains over long stretches of the frontier. One night the Marquis, with a whole army of smugglers behind him, came upon one of these secret traps and in a few moments were greeted with a volley from the Italian carabinieri. The Marquis was captured and with him many of his followers who had been wounded. Saccharine constituted the largest amount of the capture. Another of Capponi's bands, braving the carabinieri, almost openly made a rush through the frontier and had almost reached Bergamo when overtaken. They had in their possession 3,000,000 contraband cigars and cigarettes.

An ingenious form of smuggling was also detected in the harbor of Genoa. A French vessel was unloading what appeared to be a number of barrels of potatoes when one broke and the potatoes rolled on the deck. The crew gathered them up, but a few escaped their notice and when the sun fell on them they melted and proved to be exact imitations of potatoes made in wax and containing diamonds and pearls. See also *CRIME*.

Snake Bites and Poisons. One or two most important steps in the line of advance have been made during the past few years relative to snake bites and poisons generally. Of these, perhaps the most far-reaching and significant is the discovery of a serum which has the effect of rendering the bite of certain poisonous snakes harmless. The cobra, of India, has always been regarded as, perhaps, the most venomous reptile which infests those shores; and it is to be found in large numbers all over the Indian peninsula. Now, however, there is every reason to hope that the death-rate from this cause will fall enormously,—especially among the white inhabitants,—since prompt medical treatment will save the life of the bitten person in every case. Experiments are constantly being carried on, in an attempt to find a serum for the bite of every poisonous snake and reptile; but, so far, success has been secured in few instances only.

As to the question of snake-bites and deaths therefrom in America, Mr. Samuel Hopkins Adams has recently published a statement which

is very striking. He contends that there are authentic records of only about 80 deaths from snake-poison, to date, in the United States. He says "There are five varieties of venomous serpents in this country; three of them Crotalids, and two belonging to the Elaps family. The Elaps are rather rare. The Crotalids (Rattlesnake, moccasin, and copperhead) are common, and of the widest geographical distribution. Yet, on the basis of actual evidence, the amazing fact stands out that only about 80 persons, so far as is ascertainable, have ever died from snake-bite in the United States. Estimates vary as to the proportion of deaths to bites. Prentiss Willson believes that something over 10 per cent of all persons bitten by venomous snakes in the United States die. As to how many of these succumb, not to the venom, but to the misdirected efforts of misguided friends to treatment—an extremely important differentiation—he lacks the data upon which to base a reckoning. S. Weir Mitchell's figures indicate 87 per cent mortality for rattlesnake bite. This would make the venom about as dangerous as the toxin of typhoid fever, which is not generally regarded as a necessarily deadly disease. Other writers go as high as 15 per cent for the rattlesnake and as low as 1 per cent for the copperhead. All general estimates seem to leave one basic element out of consideration—the unnoted, non-fatal snake bites. That a bite resulting in death will ultimately get itself reported is reasonably certain. On the other hand, I am satisfied, from talking with plantation owners in the South, with ranchmen in the West, and with woodsmen and hunters all over the country, that, in the remoter regions, many instances of poisoning by copperheads and the smaller rattlesnakes never attain the dignity of being listed, so insignificant are they in their effects. Were all these to be recorded, I believe that the mortality ratio would fall notably."

These are very startling assertions; and it is more than probable—it is certain—that many hundreds have died from the effects of snake-bites before civilization extended its arms to cover all the vast territory which is now being reclaimed, and from which medical reports are to be obtained. At the same time, the ratio or percentage would not, probably, vary very much; and the low percentage of deaths is a striking fact. More data are required; and, during the next few years it is probable that much will be acquired; and that much will be done, also, towards finding sera for the inoculation of those who have been bitten by venomous snakes.

As to the treatment for snake-bites, etc, the modern anti-toxins have done much to simplify this treatment, and render it more certain; nevertheless, snake bites are still far from devoid of danger or the risk of death. The following directions, as given by Mr. Raymond L. Ditmars, curator of the reptile house at the Bronx Zoological Park, will prove of service.

"Every naturalist, prospector or sportsman venturing into regions known to be the lurking places of snakes, should carry a hypodermic syringe, a rubber ligature, several sharp scalpels, or a razor; a jar of antiseptic gauze, material for outside bandage (boiled cheese-cloth is best) a jar of permanganate of potassium (crystals), several tubes of anti-toxin, several strychnine tablets, and a flask of whiskey. This is the treatment: (1) Apply the liga-

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ture a short distance above the bite. This ligature should be carried in a pocket where it is immediately available (2) Enlarge the punctures by cutting into them at least as deep as the reptile's fangs have penetrated. Make two cuts over each, the cuts crossing one another. This cutting starts a flow of the poisoned blood which should be accelerated in every way possible. It is not dangerous to suck the blood away, provided there are no cuts or abrasions in the mouth or on the lips. In this way much venom may be drawn from the wounds. If a stream is nearby, wash the wounds thoroughly, then bathe them repeatedly in a solution composed of enough permanganate of potash crystals in water to produce a deep wine color.

"If no doctor is nearby, the anti-toxin should be injected by means of the hypodermic syringe in some part of the body where it will gain rapid general circulation—preferably under the skin of the abdomen.

"If constitutional symptoms develop, weakness and giddiness—a hypodermic injection of strychnine must be administered. As a stimulant, taken in very moderate quantities, whiskey or brandy is valuable. After the wounds have been thoroughly bled and washed with the permanganate of potash, the ligature may be removed, but not until every measure has been taken to draw the venom from the bitten part,—these measures including suction and massage. After that, travel to the nearest doctor as quickly as possible, as future symptoms may develop, which only he can treat."

It must be noted in this connection, however, that one portion of this treatment is not universally admitted as correct—the administration of stimulants. Several authorities contend that this lowers the vitality, and enfeebles the natural resistance of the body to the snake poison. There is doubtless a tendency among medical men to drop this part of the treatment; or to regard it as non-essential.

Snow Cure. Dr. E. C. Lane's Sanitarium at Evanston, Ill., was brought into particular prominence during the year 1910 by the introduction there of what is termed the "snow cure." The cure is used there in treating stomach and nervous troubles. It consists of the patient's rolling in the snow, diving through high drifts, and oftentimes even burying themselves in the soft, cold banks. The sanitarium yard is divided by an eight-foot fence, on one side of which the male patients take the treatment, while the other is reserved for the use of the women. After rolling about for 10 minutes the patients are given a snow rub-down, following which they say they do not feel any ill effects from the cold to which they have been subjected, but rather experience a sensation of invigoration. Doctor Lane, who is an Austrian, stoutly defended his mode of treatment when criticised by some authorities. He said it is recognized by the best European medical authorities as a splendid means of restoring adequate circulation of the blood and opening the pores of the skin. Doctor Lane says that he makes his diagnosis from the patient's eye, claiming that the white of the eye is an absolutely correct index to the condition of the stomach. He declares that the trouble with many Americans is that they live lives of inactivity, so that at the age of 30 many of them have atrophied pores.

Snow Plows. To attack deep snow drifts at greater speed and clear a railroad track at

the rate of from six to eight miles an hour, a new type of snow plow has been developed in Canada. It drives into the drifts with a steel prow, which is very narrow and forces its way into the drifts, parting the snow in such a manner that it is caught by two expellers, one on each side. These expellers are formed by blades placed upon rapidly revolving wheels in such manner that the snow is driven high into the air and so far to the side that there is no chance of any of it falling back into the cut. Meanwhile the engine makes a clear cut, 11 feet wide. The base of the plow lifts the snow close to the track into contact with the expeller and the prow concentrates it directly at the expellers. The maximum velocity of the expeller blades is at periphery 5,654 feet.

Each expeller consists of a cast iron tub, upon which are fastened the four spiral flanges, with a pitch of 14 feet. The blades which cut the snow are half inch steel plates 22 inches wide and are riveted to the flanges. The chambers in which they revolve are nine feet in diameter and 3 feet 6 inches wide. The drive gear consists of four parts, an 8-inch shaft, keyed to a sprocket wheel, which is connected with a similar wheel on the shaft of the engine wheel by steel chains. Specially constructed engines are used. The cylinders are 16 inches in diameter with 18 inch stroke, 200 revolutions a minute being the maximum. They can develop 750 I. H. P. and are placed well forward close to the expellers, shortening the drive chain and giving the whole engine greater compactness. To secure the proper blast the engine exhausts into the bottom of the smokebox.

Soccer Football. See SPORTS

Socialism. In the course of the International Socialist Congress held at Copenhagen Aug. 1910, elaborate portfolios were distributed to all the delegates containing reports on the condition and prospects of socialism in all the countries represented. From these documents it appears that socialism has gained political strength in 10 countries, while loss of prestige is confessed as regards three—Italy, Russia, and Spain. By far the most favorable showings are made by England and Germany. The British report begins by setting forth that whereas the Labor party had only 375,000 adherents in 1900, it had grown to 1,072,000 in 1907; then with a sudden leap to 1,480,000, owing mainly to the affiliation with it of the Federation of Miners, with some 148,000 members. The party now includes in round numbers 1,450,000 labor unionists and 31,000 other subscribers in its regular enrollment. Reckoning both its general and parliamentary funds it has an annual revenue of about \$50,000, and a cash balance on hand of about \$75,000. The report also claims for the cause of socialism the Independent Labor party, which has a strength estimated at between 35,000 and 60,000 men; the Fabian Society, which more than doubled its forces between 1907 and 1910, and the Social Democratic organization, which stands for pure Marxism, and claims 20,000 followers.

No doubt exists as to the genuineness of the claims in the German summary of conditions. The Social Democracy had an enrollment of 530,000 individuals, of whom 11,000 were women, at the time of the congress of Stuttgart in 1909. By the end of the year the figures had risen to 633,000 members, including 62,000

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women The enrollment is only about 19 per cent of the socialist vote cast in the last general election for the Reichstag. The annual income of the party is \$270,000. It has 48 members in the Reichstag and is represented in the diets of 19 German States. In Baden it has 20 Deputies out of 73; in Reuss 3 out of 16, in Saxony, 25 out of 91, in Saxe-Coburg-Gotha, 8 out of 30, in Schwartzburg-Rudolstadt, 7 out of 16. Besides, more than 8,000 socialists hold seats in sundry municipal councils.

In Austria, socialism, like everything else, is split up on linguistic differences. The German-speaking branch has gathered great impetus since a national conference held at Reichenberg in Bohemia in 1909, at which the party machinery was remodeled. The number of adherents is reported as swelling in a year from 112,000 to 126,000. The representation in the several diets is 16, and in municipal councils, 1,275. There are 87 socialist Deputies in the Reichsrath at Vienna. Besides the men, 14,000 women and 8,000 children have socialist clubs affiliated with the German group. The Czech Socialist party reports 130,000 members enrolled in 2,462 sections in 1910, against 100,000 members and 1,680 sections in 1907. There are 18,000 women and 10,000 boys and girls in allied clubs. The Hungarian Labor party reports the existence of 228 sections, but gives no membership figures. Its financial statement shows \$16,000 subscribed in 1909-10.

French socialism illustrates its growth in these figures. In 1906 the party represented in the Copenhagen congress had 43,462 members; in 1908 it had 48,237; in 1909 there were 51,692; and it has 53,928 adherents to-day. The annual budget amounts to 130,000 francs, or \$26,000. There are 82 departmental federations, including 1,500 sections. The party has 75 Deputies in the chamber, 81 councillors-general, 63 ward councillors, and 8,300 municipal officers. Holland had 7,478 enrolled socialists in 167 sections when the Stuttgart congress was held. Within the year the party has grown to 9,504 members in 205 sections. Belgium has a membership of 185,000, an increase of 25,000 since 1907. The number of groups or sections has increased from 803 to 903. The cooperation societies, a phase of the socialistic movement in that country, embrace 140,000 members, and their annual sales surpass 40,000,000 francs, or about \$8,000,000. In Serbia there is a socialistic workmen's party which reports an increase in its enrollment from 615 in 1907 to 1,950 at present. Bulgarian socialism has grown from 1,505 members in 1907 to 2,286 now. It reports a revenue of about \$11,000. Norway reports 26,500 members against 23,000 in 1907. An elaborate report is that of Russia. It reports a decline, and holds the government responsible, denouncing the system of repression which has crushed socialistic organizations and diminished their membership. The Lettish Social Democracy is reported as falling from 16,000 members in 1907 to 5,000 in 1908, and 3,500 in 1909. Its receipts declined from \$12,000 to about \$2,000. The Polish Social Democracy has 22,500 in 1907; it has declined to 3,500. In Finland the Party still has 71,000 members, but it had 80,000 three years ago. It has a cash balance in its treasury of nearly \$700,000. Italy also reports a decline. The party has decreased from 43,000 last year to 30,000. Sweden is the third country showing a decrease. The total of enrolled socialists is now 112,000

against 133,000 in 1908. The unsuccessful general strike last year is blamed for the loss of membership. Spain reports a party membership of 42,000 but gives no figures to show an increase or decrease.

Among reports which show progress is that of the United States. The Socialist party, which is described as the most important social democratic faction, returns its membership as 53,000 in 3,200 sections, in 1907 it was only 27,000.

In the State elections of Nov. 1910, the socialist vote show an increase in New York and 17 other States of 100 per cent. The gains made by the socialist ticket in the city and up-State were both large. In many of the labor towns the socialist vote increased three-fold; in nearly all the places where the party has any strength at all its vote was doubled. Victor L. Berger of Milwaukee was elected to Congress—the first socialist who was ever elected to that body. According to V. J. Ghent, statistician for the Socialist party, the vote throughout the country for socialist candidates was over 560,000. His figures in detail, are as follows: Arkansas, 9,196; California, 49,995; Connecticut, 12,292; Delaware, 556; Georgia, 200; Idaho, 5,342; Illinois, 49,423; Indiana, 19,632; Kansas, 15,384; Maine, 1,582; Maryland, 3,924; Massachusetts, 11,396; Missouri, 19,831; Minnesota, 11,173; Montana, 5,184; Nebraska, 6,279; New Hampshire, 1,022; New Jersey, 10,134; New York, 48,520; North Carolina, 437; North Dakota, 2,524; Ohio, 60,637; Oregon, 8,059; Pennsylvania, 53,053; South Carolina, 70; Tennessee, 1,684; Texas, 11,683; Utah, 4,857; Vermont, 1,055; Washington, 15,948; Wisconsin, 39,547; Wyoming, 1,605. This shows that the increase in the national socialist vote over the vote for Debs in the last presidential campaign was 35.5 per cent.

Society Islands. See OCEANIA.

Solar Energy. Recent developments in physical science have enabled some very practical experiments to be made in harnessing the heat of the sun, and forcing it to do a certain amount of work,—now performed by coal, electricity, etc. Sir Norman Lockyer, at a recent meeting of the British Association, stated that he hoped that this might soon be done, and from some initial experiments of his own, he had no doubt that such would be the case. Prof. R. A. Fessenden, of Columbia University, has developed a plan for running machinery by power derived from the sun, and from the wind and waves. The idea, as developed, was about as follows. He intended to erect on the cliffs along the seacoast a number of windmills. These would be made to pump up water from the sea, causing it to flow into large reservoirs, from which it would be made to fall from the heights, to run a power house below. The falling water would operate turbines connected with dynamos,—the latter in turn generating electrical energy. Supplementing the scheme, he would erect smaller windmills, modelled something after the ordinary ventilating fan, so mounted that they could be turned and made to catch the breezes at all times.

A second plan for power-generation would be to have as its principal factor specially devised tanks with glass tops. The sun's rays would heat the water in these tanks, and the steam so generated would be passed through a pipe to low-pressure turbines, in turn operating dynamos, which would create power to

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pump water to a required height, to lend power as in the case of the windmills.

The walls of the solar tanks, so Professor Fessenden says, should be preferably formed of ferro-concrete, and covered outside and inside with some reflecting material, such as tinned, iron. With the object of totally absorbing the sun's rays, and so obtaining the maximum temperature, black dye or some coloring matter should be dissolved in the water.

Solar Research. See MOUNT WILSON CONFERENCE FOR SOLAR RESEARCH.

Solar Therapy. Whether or not the sun's rays are beneficial, except in certain forms of disease, is a question which has been much discussed within the past three or four years. Until that time, it had been thought that its action was good and nothing but good, if human protoplasm were not subjected to its action for an unduly lengthy period of time. Then, Dr. Charles E. Woodruff, published his book, 'The Effects of Tropical Light on White Men,' (1905), and showed for the first time that the long-continued action of the solar rays are frequently harmful, especially to blond persons, and that human as well as plant protoplasm is frequently disintegrated by the action of the sun's direct rays, too long continued. He showed that many animals possessed natural defenses from light; and that nature protected those living in the tropics from the action of the sun's rays by heavy pigmentation. If this pigmentation be lacking, disastrous results often follow prolonged exposure to the sun's rays.

Doctor Woodruff's book created a mild sensation when it was published. While it had always been accepted, without question, that sunlight was beneficial, especially for the sick; Doctor Woodruff contended that darkness is beneficial and that sunlight is stimulating and irritating. Especially those suffering from tuberculosis should seek shade, according to Doctor Woodruff.

Dr. Adolphus Knopf, however, considers that this theory is erroneous, and that such statements are exaggerations. Doctor Knopf addressed some 50 of the leading authorities on the subject of tuberculosis, asking them the following questions.

Whether sunlight is harmful in cool or cold weather to the average tuberculous patient, provided he is careful to protect his head.

Whether the improvement noted among patients in winter in the temperate zones is due to the absence of sunlight or other reasons. Whether solar therapy, or sun-baths, are of any value in carefully selected cases under proper supervision.

Whether Doctor Woodruff's theory that blonds would do better in cold weather and cold-climate conditions and brunettes in warm has any foundation.

Forty-odd answers were received to this circular letter. In nearly all the letters received, the same answers were found: that the improvement noted in the winter months, in tuberculous patients, was due to the cold, and in no way depended upon the degree of sunlight present; and that brunettes and blonds both benefited equally in cold weather and suffered in warm.

Further, Doctor Knopf pointed out that the majority of those who die from tuberculosis live and sleep in dark unventilated rooms, into which sunlight does not enter and that scrofulous and skin diseases are almost always found

among those who live in sunless tenement houses. Further, sunlight is known to kill the germs of consumption in a few minutes, when they are exposed to its action. Thus, while there is doubtless a grain of truth in Doctor Woodruff's contention, it is greatly over-stated.

Chromopathy.—Of late years, the system of color cure, known as "chromopathy," has arisen, being defended chiefly by Doctor Babbitt, in his laborious work 'Principles of Light and Color,' though the system has been championed, also, by other writers. The fundamental idea of the doctrine consists in the application of varied colored lights,—the color depending upon the condition of the patient and the disease from which he has been suffering. Thus, red is used where there is a lack of vitality in the system, where emaciation is noticeable, where there is deficient nutrition, etc.

Blue is applied to all conditions of the system where there is inflammation, bleeding, etc., also in nervous cases.

Green is said to be useful in conjunction with blue and red; and yellow is considered a cerebral stimulant, and an emetic or laxative. Combined with red, forming orange, it is conceived to be useful in cold, dormant and chronically sluggish conditions.

How far such "instructions" are justified is not known; but little credence can be placed in the theories advanced. The chief argument in favor of its tenets seems to be a series of experiments conducted some years ago by M. Camille Flammarion, the French astronomer, who found that lettuce grown under red glass grew four times as rapidly as that grown in ordinary sunlight, while that grown under blue glass was insignificant. If plants are thus affected, it is argued, why not animals? The whole details of the system will be found in Doctor Babbitt's work, before referred to.

The Color-Cure, above mentioned, must not be confounded with treatment by means of X-Rays or Finsen rays, both of which are recognized measures of great utility. The value of the color-cure, as commonly understood, is not accepted by the majority of reputable physicians. See COLOR CURE.

Solomon Islands. In the Pacific Ocean. Germany owns part of the group (vide German New Guinea). Under British protection are the following islands of the Solomon group: Guadalcanar, Malaita, Isabel, Kausagi, Choiseul, and some other small islands. Total area, 12,000 square miles. The population is about 150,000, of whom 250 are Europeans. Tulagi is the seat of government, which is in charge of a Resident Commissioner. The revenue for 1909-10 amounted to about \$56,500, and the expenditure to \$42,500. The chief products of agriculture in the Islands are sweet potatoes, pineapples, bananas, coffee, and cocoa. About 3,425 acres of land are devoted to the growth of cocoanuts. Copra, pearl shells, and ivory nuts are collected. The exports consist of the majority of the products, and amounted in 1907-08 to the value of about \$58,000; the imports in that year were valued at \$246,000. Prior to 1904, the Commonwealth of Australia obtained laborer-recruits from the Protectorate, as many as 650 leaving the Islands in one year, of which the majority were employed in Queensland.

Solutions, Recent Studies of. Theories as to the nature and constitution of solutions have

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undergone a great change within the past few years. Up to the year 1887, chemical theories and explanations held the ground exclusively. Since the days of Lavoisier, chemical combinations which exhibit definite qualitative and quantitative composition that cannot be varied gradually have been known as compounds; whereas, in solutions, the proportion may be varied almost at will. Compounds having definite proportions, in other words, are chemical compounds; those having indefinite proportions are solutions.

Solutions were accordingly studied from the purely chemical point of view for nearly a century, until the year 1887, when two epoch-making discoveries changed the order of things, and forced scientific men to regard solutions from the physical, as well as, or rather instead of, the older point of view. These discoveries were the Van Hoff theory of dilute solutions and the theory of electrolytic dissociation of Arrhenius. The theories are really supplementary, to a great extent, as is well known. This forced scientific men to regard solutions from a different point of view, and what may be called the physical theories date from that year. These theories were popularized and strengthened by the later work of Wilhelm Ostwald.

For a number of years after this, physical theories of solutions were common, and it is only comparatively recently that the chemical theories have again been forced to the front, owing to the fact that the physical theories have been found insufficient to include and explain all the facts. Data collected since 1887 show us that the physical theories are inadequate, and that a return must be made, at least in part, to the older chemical theories.

In a recent address before the American Association for the Advancement of Science, Dr. Louis Kahlenberg said:

"Our methods for ascertaining the structure of chemical compounds are quite numerous, but they readily fall into a few categories. So we argue as to the structure of a compound from its synthesis, from its analysis, from its behavior toward various other chemical agents, from alteration by the application of pressure, heat, electricity, light, and kindred agencies, and also from its various physical and physiological properties. Thus, for example, it has always been considered sound reasoning that, because red precipitate can be formed from mercury and oxygen, these substances are in red precipitate, which conclusion is verified by the fact that the latter compound may be decomposed into oxygen and mercury.

There has never been any objection to the argument that if one of the elements actually enters into the compound during the latter's formation, or can be obtained from the compound either in the free state or in combination with other elements, that element is actually in the compound. So, since calcium carbonate may be made from calcium, carbon, and oxygen, we argue that these elements and these only, are contained in calcium carbonate.

Again, when calcium carbonate is heated, calcium oxide and carbon dioxide, and these only are obtained, and conversely calcium carbonate may be formed by the union of calcium oxide and carbon dioxide. These facts were duly expressed by the old dualistic formula for calcium carbonate CaO, CO_2 , which conse-

quently had much to commend it. Yet while we thus hold that the elements calcium, carbon and oxygen are in calcium carbonate, we do not argue that this compound contains calcium oxide and carbon dioxide, even though the last two substances will unite, and thus form calcium carbonate, or though they may be obtained as decomposition products of the latter compound. We write our formula for calcium carbonate CaCO_3 , because of the precipitation methods by which the compound may be prepared, and because of the formulæ that we assign to soluble carbonates on the basis of the products that they yield by electrolysis. We consequently hold that the carbon dioxide and lime that form when calcium carbonate is heated result from the rearrangement of the atoms and splitting of the compound on account of the violence to which it has been subjected by heating it very highly. Similarly when we recognize that carbon, hydrogen, and oxygen, are contained in cane sugar, we do not argue that the latter consists of water and carbon, though these products may among others be obtained by heating sugar. Likewise we are loth to conclude that proteins contain amino-acids, simply because they result as cleavage products when the proteins are subjected to certain rather drastic treatment."

The subject of chemical solutions is occupying a larger and larger place in modern scientific chemistry, until they now occupy a position by themselves, and specialists are devoting their time almost entirely to a study of these mixtures. A few highly important results have been obtained and deductions drawn from a study of these substances, which have a bearing upon the whole of theoretic and practical chemistry. Dr. Louis Kahlenberg, for example, in speaking of solutions before the American Association for the Advancement of Science, said in part:

"The act of solution is accompanied by all the phenomena that are observed in the case of changes that are regarded as chemical by common consent, and this shows that solutions are chemical in character. We commonly say that whenever substances combine chemically with each other, the new substance formed has properties that are quite different from those possessed by the original substances. While this is true, it is also the case that some of the properties are not changed at all, while others are but slightly modified, and still others are very greatly altered indeed. So, for instance, the weight remains unchanged during chemical action; the specific heat is frequently altered a little, whereas the color, volume, and other properties, may be very greatly affected. In general, we may say that, when an element or compound enters into combination with other elements or compounds, each of the ingredients of the new substance formed, tends to retain its original characteristics as far as the new conditions to which it has been subjected permit. In reality, every chemist is well aware of this, though so far as I know the idea has never before been stated in so many words.

The degree to which an element loses its original properties on entering into combination with other elements depends very largely upon whether the chemical change involved is a drastic or a mild one, which in turn is principally determined by the energy accompaniments of the reaction. In the study of solutions, which

SOMERS SYSTEM OF TAXATION—SOUTH CAROLINA

in general represent rather compounds formed by relatively mild changes, as compared with many of the stereotyped chemical reactions, the thought just expressed is particularly helpful."

In some quarters the idea is still prevalent that electrolytes are essentially different from non-electrolytes in their chemical behavior. This is thoroughly fallacious, for all chemical changes that occur in electrolytes can now be reproduced as a type, and as to rapidly in the best of insulators. An electrolytic solution behaves like any other solution, except that it has the property of conducting electricity with concomitant chemical decomposition. There is no way known at present in which any one can foretell whether a given solution will conduct a current or not. The only way to find out is by actual trial with the electric current itself.

There is again scarcely any difference between colloidal solutions and crystalline substances. It is now possible to separate crystalline bodies from each other by dialysis, also crystalline bodies from those which have never been obtained in the crystalline state, by having the latter pass through the septum and the crystalloids remain behind, and indeed even two colloids may be separated from each other by dialysis, as has been demonstrated by direct experiment.

The most important general conclusion that has been reached during the past few years regarding solutions is that they are now regarded from the chemical instead of from the purely physical point of view. This has been a great help. The clear recognition that solutions are really chemical in character has done much towards an understanding of the subject, and towards furthering the study of the subject in the future.

Somers System of Taxation. See TAX ASSESSMENTS, AUTOMATIC; and OHIO, *History*, 1910.

South Africa. See UNION OF SOUTH AFRICA, THE.

South African Customs Bureau. As a result of the conference of Customs Officers, held in March 1904, the various governments in the then existing Customs Union agreed to the establishment as from 1 July 1905, of a South African Customs Statistical Bureau, whose headquarters are at present in Cape Town. This bureau compiles all statistics relating to the imports into and exports from the Union of South Africa, Southern Rhodesia, and North-Western Rhodesia. The Bureau is also charged with the allocation of Customs Duties in respect of duty-paid goods removed from the Union to either of the Rhodesias, or vice versa, and is now under the direct control of the Department of Commerce and Industries of the Union of South Africa.

South America. See ARGENTINE REPUBLIC, BOLIVIA, BRAZIL, BRITISH GUIANA, CHILE, COLOMBIA, DUTCH GUIANA, ECUADOR, FRENCH GUIANA, NICARAGUA, PERU, VENEZUELA.

South Australia. See AUSTRALIA.

South Carolina. A State of the South Atlantic Division of the United States, having, according to the census of 1910, a population of 1,515,400, a gain of 13.1 per cent over 1900. The population per square mile is 49.7. The area is 30,989 square miles, of which 400 is water. Columbia is the capital; population, 26,319.

Agriculture.—The running bales of cotton, counting round as half bales and excluding linters, ginned to 13 Dec. 1910, were 1,107,556. The cotton crop of 1909 was 1,137,382. The acreage, production and value of the important farm crops of South Carolina for 1910 was as follows: Corn, production, 44,733,000 bushels, acreage 2,418,000, value \$36,681,000, winter wheat: production 4,983,000 bushels, acreage 453,000, value, \$6,279,000, oats, production 4,599,000 bushels, acreage 219,000, value \$2,989,000; rye, production 40,000 bushels, acreage 4,000, value \$58,000; rice, production 357,000 bushels, acreage 17,000, value \$268,000; potatoes, production 900,000 bushels, acreage 10,000, value \$945,000; hay, production 84,000 tons, acreage 67,000, value \$1,344,000; tobacco, production 18,900,000 pounds, acreage 30,000, value \$1,625,400. The farm animals on 1 Jan. 1910 were as follows: Horses 87,000, value, \$11,049,000; mules 144,000, value \$22,752,000; milch cows 140,000, value \$4,046,000; other cattle 227,000, value \$2,724,000; sheep 56,000, value \$134,000, sheep of shearing age, 50,000; average weight of fleece, four pounds; per cent of shrinkage, 42; wool, washed and unwashed, 200,000 pounds; wool scoured, 116,000 pounds. There were 699,000 swine, of the value of \$5,033,000.

Mining and Manufacturing.—The phosphate beds are in a belt near the source of the Wanda River in Charleston County, and they extend to the mouth of the Broad River. The belt is parallel with the coast, and runs back 20 miles. The last figures obtainable show an annual phosphate production of 225,495 tons, value \$989,881. The clay products amounted to \$615,248. The deep mines of the State yielded 2,560 fine ounces of gold, and the placer, 39. The gold production for 1909, however, only amounted to \$3,500 in value. The silver production was 200 fine ounces, value \$100. The gold was produced from two placers and five deep mines. There are also gas, coke, and coal. The mineral products were valued at \$2,081,001. The capital employed in the manufacturing interests was \$113,422,224, and the value of the product \$79,370,262. The wage-earners numbered 59,441, and the wages paid \$13,868,950. Cotton goods is the leading industry, the capital employed amounting to \$82,337,429, material \$34,308,311, and the output \$49,437,044. There were 37,271 employed in the industry. Lumber and timber products, fertilizer and cotton seed and oil cake are other important industries.

Fisheries.—The last figures show the employment of 2,559 persons in the fishing industries of the State. There were 108 vessels and 1,719 boats used. The value of the fishing products amounted to \$288,328. The oyster was the most important product. There were taken 1,563,100 bushels, of the value of \$136,790. The shad catch was 464,400 pounds, value \$40,730. Other fish are sea bass, whiting, shrimp, prawn, terrapin, trout, sheephead, and clams.

Government.—The Governor is Cole L. Blease, Democrat, salary \$3,500, term two years from Jan. 1911. Some other State officers are: Lieutenant-Governor, C. A. Smith, Secretary of State, R. M. McCown; Attorney-General, J. F. Lyon; Comptroller-General, A. W. Jones. The State Legislature in both houses is composed entirely of Democrats. The United States Senators are Benjamin R. Tillman and Ellison D. Smith, both Democrats. The Representatives in

SOUTH DAKOTA

Congress are George S. Legare, James T. Byrnes, Wyatt Aiken, Joseph T. Johnson, David E. Finley, J. Edwin Ellerbe, and Asbury F. Lever.

Finance — The bonded debt of the State is \$6,526,885. The valuation of the real estate is \$136,438,358, and of the personal property, \$134,607,944. The tax rate is 5.75 per 1,000. The last available figures showed receipts of \$2,914,102, and expenditures of \$2,489,732. There are 31 National banks with 18,275 depositors, and \$5,746,861.26 deposits, 117 State banks having 20,576 depositors, and \$4,167,858.73 deposits; three private banks, having 573 depositors, and \$283,627.13 deposits. The Savings banks have 32,380 depositors, and \$9,808,101.98 deposits.

Religion and Education — The Baptists and Methodists are the prevailing religious denominations. The Baptists number 122,153 male, and 202,659 female; the Methodists, 93,278 male and 134,200 female, the Presbyterians, 13,086 male and 18,508 female. The annual expenditure for the free schools was \$1,898,885, and for State colleges, \$527,000. The pupils enrolled in the schools were 319,614, and the average daily attendance, 231,289. The teachers numbered 6,436. There were 12 colleges and higher institutions of learning, with 296 professors and instructors and 3,122 male and 1,004 female students. Their total income was \$709,998, and the value of the productive furs, \$997,074.

Charities and Corrections — The charities maintained by the State are a hospital for the insane, an asylum for the deaf, dumb, and blind, a Confederate Home, and an industrial home. The appropriation for pensions amounted to \$250,000; for the Confederate Home, \$14,000; for the industrial school, \$7,500, and the insane hospital, \$272,701. There are also 9 orphan asylums, 10 hospitals, and 10 homes for adults and children, supported by private individuals. Charleston and Columbia have their own overseers for the poor. The County Commissioners have charge elsewhere. A three years' residence is considered a legal settlement in order to obtain relief. For the last fiscal year for which figures are available, the total receipts were \$133,344.68, and the expenditures \$86,569.77. The inmates of the penitentiary numbered 811. Part of the receipts are from farm products where the convicts labor.

Legislation — There are annual sessions limited to 40 days. The 1909 session passed acts requiring electric railway companies to equip cars with closed vestibules in winter for the protection of the motormen; creating a board of commissioners on uniformity of legislation; regulating the manufacture and sale of commercial fertilizers; making it a misdemeanor to publish the name of any victim of rape or assault with intent to ravish, and permitting the evidence of the women to be taken by deposition; prohibiting unfair commercial discrimination between sections of the State, and unfair competition by selling goods in one locality at a low price to destroy the business of competitors, making it a misdemeanor to solicit orders for liquor and requiring banks to accumulate a 25 per cent reserve.

South Dakota. A State of the West North Central Division, having a population, according to the census of 1910, of 583,888, a gain of 45.4 per cent. The population per square mile

is 76. The State has an area of 77,614 square miles. The capital is Pierre.

Agriculture — There are more than 40,000 acres at present under irrigation, and the Federal Government is planning to reclaim 100,000 more in the semi-arid land of the Belle Fourche Valley. There is a \$200,000 fund for irrigation in the western section. The acreage, production and value of the important farm crops for 1910 is as follows. Corn, 54,050,000 bushels, acreage 2,162,000, value \$21,020,000; spring wheat, 46,720,000 bushels, acreage 3,650,000, value \$41,581,000; oats, 35,075,000 bushels, acreage 1,525,000, value \$10,522,000; barley, 18,655,000 bushels, acreage 1,025,000, value \$10,633,000; rye, 595,000 bushels, acreage 35,000, value \$363,000; flaxseed, 3,300,000 bushels, acreage 660,000, value \$7,557,000; potatoes, 2,420 bushels, acreage 55,000, value \$2,057,000; hay, 408,000 tons, acreage 510,000, value \$2,897,000. The farm animals on 1 Jan 1910 were horses 612,000, value \$64,260,000, mules 10,000, value \$1,210,000; milch cows 656,000, value \$21,648,000; other cattle 1,341,000, value \$28,832,000; sheep 829,000, value \$3,316,000; sheep of shearing age 1 April 1909, 650,000; average weight of fleece, 65 pounds, per cent of shrinkage, 60; wool, washed and unwashed, 4,225,000 pounds, wool, scoured, 690,000 pounds. The swine number 805,000, value \$8,936,000.

Mining and Manufacturing — Gold is the chief mineral of the State. It is found in the Black Hills, the production being in the main from the Homestake Mine. The last available figures give the annual gold production at 331,363 fine ounces, and its value \$6,840,900; silver, 205,600 fine ounces, commercial value, \$107,000. The distribution of the amount of gold and silver extracted is as follows. Gold, 369,945 fine ounces, from the deep mines, and 481 placer; and silver, 245,202 fine ounces dry silicious ores, and 3,500 fine ounces lead ores. Natural gas, lead, stone, and clay products are also to be found in the State. The number of manufacturing establishments according to the last figures were 1,019, a gain of 49 per cent over 1904, the capital, \$12,971,000, a gain of 71 per cent for the same period; the cost of material, \$11,463,000, a gain of 32 per cent; salaries and wages, \$2,901,000, a gain of 69 per cent, miscellaneous expenses, \$1,395,000, a gain of 68 per cent; value of the products, \$17,845,000, a gain of 36 per cent, the value added by manufacture (products less cost of material) was \$6,382,000, a gain of 45 per cent; number of salaried officials and clerks, 679; wage-earners, 3,585. There are 28 steam laundries, and the capital invested is \$336,000. Flour and grist milling and lumber and timber are leading manufacturing industries.

Government. — The Governor is Robert S. Vessey (Republican), salary \$3,000 per annum, whose term of office is two years, and expires in Jan 1913. Other State officers are Lieutenant-Governor, Frank M. Byrne; Secretary of State, R. S. Polley; Treasurer, George Johnson; Attorney-General, Royal C. Johnson; Auditor, H. B. Anderson, all Republicans. The composition of the Legislature is as follows. Senate Republicans, 34; Democrats, 11; House Republicans, 99; Democrats, 16. The United States Senators are Robert J. Gamble and Coe I. Crawford, both Republicans. The Congressmen are Charles H. Burke and Eben W. Martin, also Republicans.

SOUTHERN NIGERIA—SOUTH POLAR RESEARCH

Finance—The State Debt, 30 June 1910, was \$970,425 23. For the fiscal year ending 30 June 1910, the receipts amounted to \$5,229,751 61, and the disbursements \$4,567,182 53. The assessed valuation of the real property is \$235,006,539, and personal, \$86,064,126. The rate of taxation is \$4 per 1,000. There are 89 National banks, with 12,823 depositors, and \$3,703,238 44 deposits; 332 State banks, with 22,642 depositors and \$7,547,085 07 deposits; private banks, with 859 depositors and \$280,673 81. The State has five loan and trust companies, with 3,664 depositors, and \$858,198 55 deposits. There are 10 savings banks, with 3,024 depositors, and \$684,113 68 deposits.

Religion and Education—The more important religious denominations are the following: Roman Catholic, 28,669 male and 27,998 female; Lutheran 18,859 male and 18,523 female; Methodist, 5,811 male and 9,324 female; Baptist, 2,364 male and 3,723 female. There was expended for common schools during the last fiscal year, \$732,187 83. The pupils enrolled numbered 117,609, and the average daily attendance was 72,363. The State has seven universities and colleges, with 1,206 male and 1,191 female students. Their total income was \$430,104.

Charities and Corrections—In the list of charities are eight hospitals, two orphan asylums, a home for adults, a school for the deaf, and another for the blind. A pauper to be cared for must have settled 90 days in the county. There is the right to appeal to the County Circuit Court judge if relief be refused. The State has institutions for the blind, deaf, feeble-minded; a hospital for the insane, and a training school. The Federal Government has a hospital for insane Indians.

Legislation.—The Legislature meets biennially, the session being limited to 60 days. The last session was in 1909, when acts were passed fixing a maximum of 2 cents a mile for passenger fare, penalizing railroad companies for delays in adjusting claims, giving the railroad commissioners jurisdiction over the telephone companies, fixing \$10,000 as the maximum recovery in injury cases by wrongful death, providing standard forms of life and fire insurance policies, prohibiting trusts and monopolies providing for primary elections, creating a livestock sanitary board, distributing hog cholera serum, enacting measures to prevent spread of disease among sheep, and "foul brood" among bees, a pure food and pure drug law, regulating hotels, a law providing for the planting and care of forest trees and inspection of nurseries and imported trees to prevent introduction and spread of injurious insects, indeterminate sentences in certain cases of first offense, and giving portion of convict's earning to support of his family.

Southern Nigeria. See BRITISH WEST AFRICA.

South Polar Research. While recent events in the history of South Polar exploration have not been so startling as those in the Northern region, Antarctic progress has been much more steady. Never in the annals of Antarctic discovery have so many explorers been engaged in the search for the South Pole. The achievements of former times are being constantly and rapidly outdone. Moreover, recent explorations of the Antarctic assume a more international character than heretofore. To-day few of the principal countries are not represented in the

noble work of pole-hunting in the Antarctic. Nevertheless, the former spirit of unfriendly rivalry has altogether vanished from these expeditions. The spirit of helpful cooperation, which enables several explorations to be carried on simultaneously for a common end, has gradually been displacing that of antagonism. In this respect South Polar research may be said to have become international. And this spirit has been manifestly at work ever since 1905, when the German, Drygalski, the Englishman, Robert Scott; the Swede, Norden-skjöld; the Frenchman, Charcot, and the Scotchman, Bruce, have all helped to lift the veil that hangs over the Antarctic region.

Among most recent Antarctic explorations those of Lord Shackleton, made during 1903-09, stand out preeminent. Starting from Erebus Island, South Victoria Land, in the spring of 1908, four important land journeys were made by Shackleton's series of expeditions toward the South Pole.

The first culminated in the ascent of the Erebus volcano—an altitude of 13,379 feet—on 10 March 1908. The second journey was for the South Pole direct. It was begun on 29 Oct. 1908, and lasted five weeks. Traveling over the Great Ice Barrier, the party passed Scott's farthest south, to find the coast of the Antarctic Continent directly to their right. Pushing ahead, it found itself within 111 statute miles of the South Pole on 9 Jan. 1909, when farther progress was rendered physically impossible through lack of food. On 1 March this party returned to winter quarters. Even while this expedition was still in progress another was under way to the northwest. This party passed across the interior ice cap and reached the South Magnetic Pole—72° 25' S. Lat. 155° 16' E. Long.—on 1 Jan. 1909. A fourth party traveled far inland up the Ferrar glacier. The entire expedition returned home in the spring of 1909. The cost of the expedition was so great that Mr. Shackleton, on his return, found himself \$175,000 in debt, despite the large funds he had previously raised for the purpose. Fortunately, the British government made him a grant of \$100,000.

The scientific results of this remarkable series of exploration—which all but reached its goal—are numerous. Conclusive evidence was secured to prove that the Antarctic icebergs are largely or wholly snowbergs. The South Pole mystery has been absolutely dispelled, and numerous other scientific theories have been either confirmed or disproved. In view of the great value of these explorations, their promoter has been duly honored by the entire scientific world. In America the National Geographical Society, before whom the explorer lectured in Washington on 26 March 1910, presented him with the Hubbard Gold Medal. In England he was knighted for his great achievement. By penetrating farther than any of his predecessors, Lord Shackleton really reached the very heart of the Polar region (88° 23') and proved beyond doubt the existence of a South Polar continent. His unprecedented success naturally gave a new impetus to Antarctic exploration. Lord Shackleton, who is credited with the possession of great organizing power, a vivid imagination, and the originality of genius in devising plans, has certainly demonstrated what may be done in Antarctic exploration by one working with a free hand, a firm purpose, and a mature plan. *The National Ge-*



R S VESSEY,
GOVERNOR OF SOUTH DAKOTA.

SOUTH POLAR RESEARCH—SPAIN

ographic Magazine calls Lord Shackleton's narrative "one of the most inspiring stories of adventure and accomplishment ever told, the courage, wit, pluck, resourcefulness, and good comradeship of the leader and his men making a most thrilling tale."

Inspired by this wonderful achievement, no fewer than five Antarctic expeditions were planned for 1910-11. These include one by Capt. Robert F. Scott, of England; one by Capt. Roald Amundsen, of Norway; one by Wilhelm Filchner, of Germany, and one under the combined auspices of the Peary Arctic Club and the National Geographic Society of America. This shows clearly enough both the national and international character of present-day Antarctic exploration.

Captain Scott's plan is to establish two bases on the Antarctic ice barrier in January or February of 1911, one at MacMurdo Bay and the other at King Edward's Land, or some 450 miles apart—to be, if possible, connected by wireless telegraph stations. Each of these bases will be about 850 statute miles from the South Pole, and by means of them the two ends of the barrier are to be explored. Then from one of these points, the 850 miles to the pole are to be covered. The route will lie over ice and mountains, and the means of transport will be motor sledges (an innovation in polar exploration) and sledges drawn by ponies and dogs. It is expected that the journey both ways will be accomplished in from 120 to 150 days, the expedition to have \$200,000 at its disposal.

The plan Filchner, the German explorer, would carry out is not a very new one; but, aside from the main question of Antarctic explorers, he puts an altogether new problem to the foreground. His task will be, chiefly, the clearing up of the relation between the east and the west Polar regions. He is greatly interested to determine whether these two regions are connected or divided, and to this great geographical mystery—a mystery greater than the South Pole itself, scientists believe—the German explorer intends to address himself. Preparations for Filchner's expedition were to be made during the summer of 1910, but the start will not be made before the summer following. In carrying out his plan, Filchner proposes to employ two small vessels, needed to steer through the ice-channels; sledges, drawn by ponies from Greenland and dogs from Central Asia. The entire expedition, it is expected, will require about three years, but no very unusual outlay.

With so many expeditions either actually under way or contemplated for the coming year, 1911 promises well to eclipse everything ever done in Antarctic exploration. That the various parties intend, as we have seen, to attack the problem in different ways and at different places, lends still greater hope to their joint enterprise. Now that the North Pole mystery is believed to have been solved, the South Polar explorers seem to be determined to solve that of the Antarctic also. British workers in this field are at present by far the more systematic and energetic. The fact that the Arctic prize seems to have been won by an American, inspires English Antarctic explorers with especial enthusiasm.

An American expedition, headed by Capt. Robert A. Bartlett and Harry Whitney, is announced to set out for the South Pole in a race

against the Scott British expedition, which has already started. The American expedition will sail in the Fall of 1911. Its financing will be by private individuals. The last seaport will probably be Punta Arenas, Chile, and an effort will be made to reach Coats Land before navigation is closed up in February. Coats Land is terra incognita. The expedition under Bruce discovered it in 1904, but made no landing. The American expedition plans to make its polar dash from there, over a distance of about 800 miles. "Coats Land," states Captain Bartlett, "is almost opposite the point from which Shackleton started his land journey toward the pole. We'll start our land journey in the spring, after the Arctic night, when the light comes back. The relay system of sledding will be used, with 'caches' of provisions at intervals of about every 100 miles. There will be 15 sledges, each in charge of a member of the expedition." The expedition will consist of about 25 men. For clothing, furs will be used entirely. Pemican, biscuits, and tea will be the main food. Dogs will be used for the sledges."

Capt. Robert F. Scott, the British rival of Whitney and Bartlett, left Cardiff 15 June 1910. The ship he employed, the *Terra Nova*, is an old Dundee whaler, built a quarter of a century ago, but thoroughly refitted for its Antarctic journey. Scott's expedition, when it started, was said to be the most completely and ingeniously equipped of any that ever set out on a polar quest. It comprises 60 men in all. Scott's route is from New Zealand southward. His southern base is Macmurdo Sound, almost directly opposite Coats Land, where Whitney and Bartlett expect to start their "dash" to the pole. In Jan 1911 the Scott expedition proposes to land 22 to form a western party, with a hut, provisions, and equipment, and to establish a western station. By the end of February the western party will have established a system of depots south of the ice barrier. In April it is expected that the *Terra Nova* will return to New Zealand. In October those left behind intend to begin the actual dash for the pole—six months ahead of Whitney and Bartlett, if the plans of the latter are carried out. A feature of the Scott expedition is the employment of an improved motor sledge which will partly take the place of the dogs and ponies in hauling the loads.

Spain. Spain is a monarchy occupying the eastern part of the Iberian Peninsula in southwestern Europe. At one time its colonial possessions included more than half the Western Hemisphere, but they are now reduced to the Balearic and Canary Islands and the Spanish possessions on the north and west coast of Africa.

Area and Population.—The area of continental Spain is 190,050 square miles; with the colonies the total area is 194,783 square miles. The country is divided into 49 provinces, of which Barcelona and Vizcaya (Biscay) are most populous, the average population per square mile being 96.7, and the total population in 1908, 19,712,585. The principal cities are Madrid with 540,000 inhabitants, Barcelona with 700,000, Valencia with 214,000, Seville with 150,000, Malaga with 130,000, Murcia with 112,000, Carthagea with 100,000, and Zaragoza with 100,000. There are also 11 other towns with over 50,000 inhabitants. The average rate of increase in the population is about 0.90. The

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population of Ceuta is 13,000. Spain also has on the African coast the Alhucema Isles, with a population of 353, the Chaferinas, 652; Melilla, 8,956; Penon de la Gomera, 321, and Rio del Oro, 130. The North African possessions are used chiefly as convict stations. Emigration in 1907 amounted to 130,640, and was chiefly to Argentina, Brazil, Cuba, and Mexico. The people are mostly of the more or less homogeneous Spanish race. The Basques number 440,000, and are found mostly in the Pyrenean region. They belong to a different race from the Spanish, being the original inhabitants of the country, and their language forms the foundation of the Spanish language. They were the Cantabri of Roman history. There are 60,000 Morescoes in the south, 500 gypsies, and a small number of Jews.

Government—The present constitution of Spain dates from 30 June 1876, and by it the executive rests in the King, and the power to make laws "in the Cortes with the King." The senate and congress are equal in authority. The present King, Alfonso XIII, son of the late King Alfonso XII and Maria Christina, an Austrian princess, was born after his father's death, 17 May 1886. On 31 May 1906 he married Princess Victoria Eugenie, daughter of the late Prince Henry of Battenberg and Princess Beatrice of England. The heir to the throne is Prince Alfonso, born 10 May 1907. Prince Jaime and the Princess Beatrice are the other children of the marriage. The royal family belongs to the House of Bourbon.

Finance—The revenue for 1909 amounted to \$187,414,755, and the expenditure to \$186,392,825. In 1910 the outstanding debt amounted to 9,418,001,057 pesetas.

Army.—See **ARMIES OF THE WORLD**.

Navy.—See **NAVIES OF THE WORLD**.

Education and Religion.—According to the latest available returns about 70 per cent of the inhabitants of Spain can neither read nor write. Some four centuries ago the universities of Spain were centers of culture and science for all Europe, but there has never been a time when there was anything like general education in the country. By a law of 1857 education was to be compulsory, and there was to be a primary school for every 500 inhabitants, but this law has not been enforced, partly on account of the extreme poverty of many parts of Spain. There is now, however, a Minister of Education, with a council, and 10 educational districts, with the universities as centers. The total sum spent per year on primary education is about \$5,000,000. Most of the children are educated free. There are at present about 26,000 public schools with 2,000,000 pupils; there are over 6,000 private schools, with 350,000 pupils. The law requires that there shall be in every province a middle-class school preparing for the universities, of which there are nine, the total attendance being about 16,000. The universities are at Barcelona, Granada, Madrid, Salamanca, Santiago, Seville, Valencia, Valladolid, and Zaragoza. The government also supports various special schools for engineering, agriculture, architecture, music and the fine arts, etc. The national church of Spain is the Roman Catholic, and practically the whole population is of that faith. There are about 30,000 non-Catholics, including 7,000 Protestants and 4,000 Jews. About 5,200 religious are engaged in school work of various kinds. There are about 3,253 religious orders in Spain, 597 of

which are for men, and 2,656 for women. Of those for men, 294 are devoted to education, 92 to the training of missionaries, and 97 to the training of priests. There are in all some 10,000 monks. The orders for women comprise 910 for education, 1,029 for charity, and 717 for a contemplative life. There are about 40,000 nuns.

Agriculture—Spain is, and has always been, a country whose interests are mainly agricultural, and for this reason many of the provinces are extremely poor, the soil having become worked out. 79.65 per cent of the land is reckoned productive, of this 33.8 per cent is given to farms and gardens, 37 to vineyards, 16 to olive culture, 197 to natural grass, and 208 to fruits. In recent years the soil has been greatly subdivided. In 1800 there were 677,520 farms, and there are now 3,426,083 recorded assessments to the property tax. The principal crops are wheat, barley, rye, oats, maize, vines, and olives. Other products are esparto, flax, hemp, pulse, oranges, and hazel nuts.

Fisheries—In the fisheries, the total number of boats employed is about 14,700, and the number of fishermen, 67,000; the annual catch amounts to about \$7,600,000. The most important catches are sardines, tunny fish, and cod. There are 400 factories employing 16,500 workmen, for the preparation of sardines.

Exports and Imports—In 1909 the total exports were \$171,495,925, and the total imports, \$176,115,000. The principal imports are raw cotton, spirits, fish, wheat and flour, sugar, coal, timber, woollen manufactures, machinery and railway materials, hides, etc. The chief exports are wine, copper and copper ores, lead, iron ores, olive oil, raisins, oranges, cork, esparto grass, wool, salt, quicksilver, grapes, sardines, and conserved fruits of one kind and another. In 1908 the total value of wine exported was \$12,013,700, of which rather more than half was common wine, \$3,494,000 sherry, and the rest for full-bodied wine.

Manufactures and Minerals—Spain is rich in minerals, iron being found in the provinces of Vizcaya, Santander, Oviedo, Huelva and Seville; coal in Oviedo, Leon, Valencia and Cordova; zinc in Santander, Guipuzcoa and Vizcaya; cobalt in Oviedo; lead in Murcia, Jaen and Almeria; mercury in Ciudad Real; silver in Guadalajara; sulphur of soda in Burgos; salt in Guadalajaran, sulphur in Murcia and Almeria, and phosphorus in Caceres and Huelva. The manufacture of cotton goods employs about 68,300 looms, with 2,614,500 spindles; in woollen manufactures there are 8,800 looms, with 662,000 spindles. There are some 144 paper mills, mostly in Catalonia; paper-making is an old industry in Spain, and printing was done there as early as anywhere in Europe. There are 34 glass-making factories, and numerous cigar and cigarette factories, the product of which is, however, mostly consumed in the country.

Communications.—The merchant navy consists of 504 steamers, of 423,000 tons net, and 304 sailing vessels of 28,700 tons net. There are over 9,000 miles of railways open for traffic, all belonging to private companies, but most of the companies have guarantees or subventions from the government. There are about 22,000 miles of telegraphs in Spain, and the total number of telephone stations is about 18,572.

Social Conditions.—The social life of Spain is to some extent in a transition stage; the country is feeling the impetus of the rational-

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A GROUP OF PEASANTS FROM THE PROVINCE OF LEON, IN THEIR CHARACTERISTIC COSTUMES

istic movement in France and Portugal, and there is a certain amount of rebellion against clerical influence. This, however, is lessened by the course which the King and the Cabinet have taken, their policy being at once stronger and more progressive than that of the Portuguese government in meeting similar conditions.

History, 1910 — The present situation in Spain has interested the world more than most of the recent developments in European monarchies, as it has a strong picturesque and personal element in addition to possible historical importance. Spain, known for centuries as the most Catholic country in Europe, has developed a strong anti-Clerical party, and the sympathies of the Prime Minister, Canalejas, are in that direction. Matters came to a head in 1910, and culminated in a conflict with the Vatican.

Louis Morote, an intimate friend of the Premier, states the case briefly as follows. During the years 1834-74 there were scarcely any religious in Spain, and in 1851 a Concordat was agreed on providing for three religious orders. After the return of the Bourbons, however, there was an influx of monks, and they increased from about 3,000 to nearly 70,000. In 1901 Gonzalez, then Minister of the Interior, ordered that all religious communities should register, those having private industries to pay taxes to the government. They did not comply. From 1900 Canalejas was steadily working against the Clerical party, and when, after the resignation of Senor Sagasta, Canalejas became head of the new government, he would not assume the reins of power until a compact had been signed by Sagasta, Moret, Weyler, and the Marquis di Viga Armigo to lay before the Cortes a law of associations giving him power to expel all religious bodies not included in the Concordat. Senor Moret, however, withdrew from the compact, and the plan fell through for the time. After various vicissitudes, the present Cabinet was formed 9 Feb 1910, under Canalejas, and he promulgated a royal order reaffirming the decree already referred to, and another giving Protestants permission to exhibit the symbols of their faith on their buildings. He also presented to the Cortes a bill substituting for the religious oath the declaration "On my word of honor." Finally, came the decree known as "el candado" (the padlock), under which no more religious communities can enter Spain without special permission from the government. It was this last decree which aroused the resentment of the Vatican, and those who voted for the law have been excommunicated.

The problem of the King in the situation is a difficult one. His support means the triumph of Canalejas, whereas his opposition would be taken to mean that the monarchy is opposed to progress. Strong protests have been made by the Catholics against "French governmental methods" in Spain, and equally strong sentiment exists against the clericalists. On 22 Dec 1910 the "padlock bill" passed by a vote of 108 to 29.

The objection of the Vatican was based on the fact that negotiations were under way for the revision of the Concordat of 1851, and hence, it was argued, Spain could not in good faith adopt legislation affecting the congregations involved until these negotiations were concluded. Canalejas, on the other hand, claimed that the matter covered by the "padlock bill" was not properly a subject of diplomatic ex-

changes between Madrid and Rome, and that religious liberty should be maintained. In this attitude he has been practically supported by the King. Canalejas is himself an avowed Catholic, and it is hoped that in time some way out of the difficulty will be found, satisfactory both to the Vatican and to Spain.

Another move which the government has made is in the direction of barring the exiled Orders from Portugal. There is, in fact, a practical difficulty confronting Spanish statesmanship, arising from the recent events both in France and Portugal. Spain is not a wealthy country, and the incoming of exiled religious from countries on both sides of her, in addition to those houses already supported by her people, constitutes a heavy drain on resources already taxed quite heavily. It does not appear that the Premier is in any way disposed to interfere with the Catholic faith being the state religion of Spain, or to make Spain less a Catholic country than she has always been, but the problem of the exiled monks and nuns is a serious one from any point of view.

The situation is further complicated by the fact that the extreme Conservatives are to some extent supporters of the pretender, Don Jaime, and the clerical agitation in the summer of 1910 was mixed up more or less with a Carlist uprising. The prompt action of the government in having troops ready for instant use, however, prevented any disturbance of consequence. There was another complication in the sympathy of some of the Spanish Republicans with the Portuguese Republicans, and a great deal of uneasiness was felt lest the history of Lisbon should be repeated in Madrid. Canalejas, however, made the public statement that he would answer for it with his head, that Spain should not follow Portugal's example.

One factor tending to preserve the monarchy has unquestionably been the struggle with the Vatican. Anti-clericalism has been one of the chief weapons of the Republicans in both Spain and Portugal, and the attitude taken by the Premier has made this weapon useless. In short, the vigorous action of the Premier and the popularity of the young King probably saved the situation.

A minor agitation is now going on over the new law for obligatory military service, which does not exempt the clergy, and which is further objected to because, so far from abolishing the arrangement under which substitutes are purchased, it offers a system by which recruits can be discharged after some months by the payment of an indemnity.

There is every evidence that a new régime is under way in Spain, and that King Alfonso is in sympathy with it. One of the signs of this is that Queen Victoria had his endorsement in her combat with some of the time-honored red tape of the court, which has always been irksome to her as an English princess. While she was not altogether successful in her endeavor to lessen the formality which from time immemorial has hedged the Queen of Spain, she has made some innovations which are likely to have results. The most important is in the care of the royal children, who have more of the Queen's personal attention than the court ladies of the old régime considered at all proper.

Spalding, Francis Spencer. Third P. E. missionary bishop of Utah, and 222d in succe-

sion in the American episcopate b Erie, Pa., 13 March 1865. His father, the Rt Rev John Franklin Spalding, D.D., was first bishop of the missionary diocese of Colorado, which included the territories of Arizona, New Mexico, and Wyoming, and a descendant of Edward Spalding, who came from England in 1630 and settled in Brantree, Mass. Francis Spencer Spalding was graduated from Princeton University A. B., 1887, and from the General Theological Seminary, New York City, B.D., 1891, S.T.D., 1905. He was ordered deacon in 1891, and advanced to the priesthood the following year, and was rector of All Saints' Church, Denver, Colo., 1891-92; St. Luke's Church, Montclair, Colo., 1892-96, and of St. Paul's Church, Erie, Pa., 1896-1904. He was elected bishop of the missionary district of Utah, as successor to the Rt. Rev Abiel Leonard, who died 3 Dec. 1903, and he was consecrated 14 Dec. 1904. Bishops Tuttle, Whitaker, and Scarborough acting as consecrators, assisted by Bishops Whitehead, Walker, Talbot, and Vincent. At the time of his consecration his see was known as the missionary district of Salt Lake, and in 1907 it was changed to that of Utah.

Sparrow, English. See ENGLISH SPARROW.

Spelling, Simplified. See SIMPLIFIED SPELLING.

Spies. The charges of espionage that have been bandied from one side to the other by the German and British press appeared to have found some ground in fact when the two Englishmen, Brandon and Trench, were arrested on 21 Aug. 1910, on the German Island of Borkum and accused of stealing military secrets. Both men were British naval officers, and, according to the Admiralty report, were "under leave of absence to study language abroad." The German case was that on the night of 21 August the lookout on the military watch tower at Borkum noticed a sudden flash of light. The alarm was given and in a few minutes a brilliant searchlight was brought into action, and its rays showed the form of a black figure crouching on ground strictly forbidden to civilians. The guard was turned out, and after they had threatened to shoot the trespasser Lieutenant Brandon was arrested. The *Vossische Zeitung* relates how, after Brandon and Trench had been arrested "A most important discovery was made. In the mattress of the beds there had been hidden a great number of photographs and charts of the North Sea, as well as plans of the forts of Borkum and the estuary of the Ems." At the trial of the two Britons in Dec. 1910, Brandon testified that he was in the service of the British Admiralty, and at the time of his arrest was collecting information and placing it at the disposal of a third person connected with the Intelligence Department of the Admiralty. Captain Trench also admitted that he originated the plan for sketching the fortifications at Borkum. The president of the court agreed to the proposal of the Imperial Prosecutor that the proceedings should be public. The prosecutor said the British newspapers had told the British public that Germans were continually spying in England in preparation for an invasion of that country. Here, said the prosecutor, were two British officers on the active list whose papers and admissions showed plainly that they came to Germany to

gather information which could only serve to facilitate an unforseen attack on Germany. The utmost publicity, he said, was therefore desirable. Trench and Brandon were each sentenced to four years' imprisonment in a fortress.

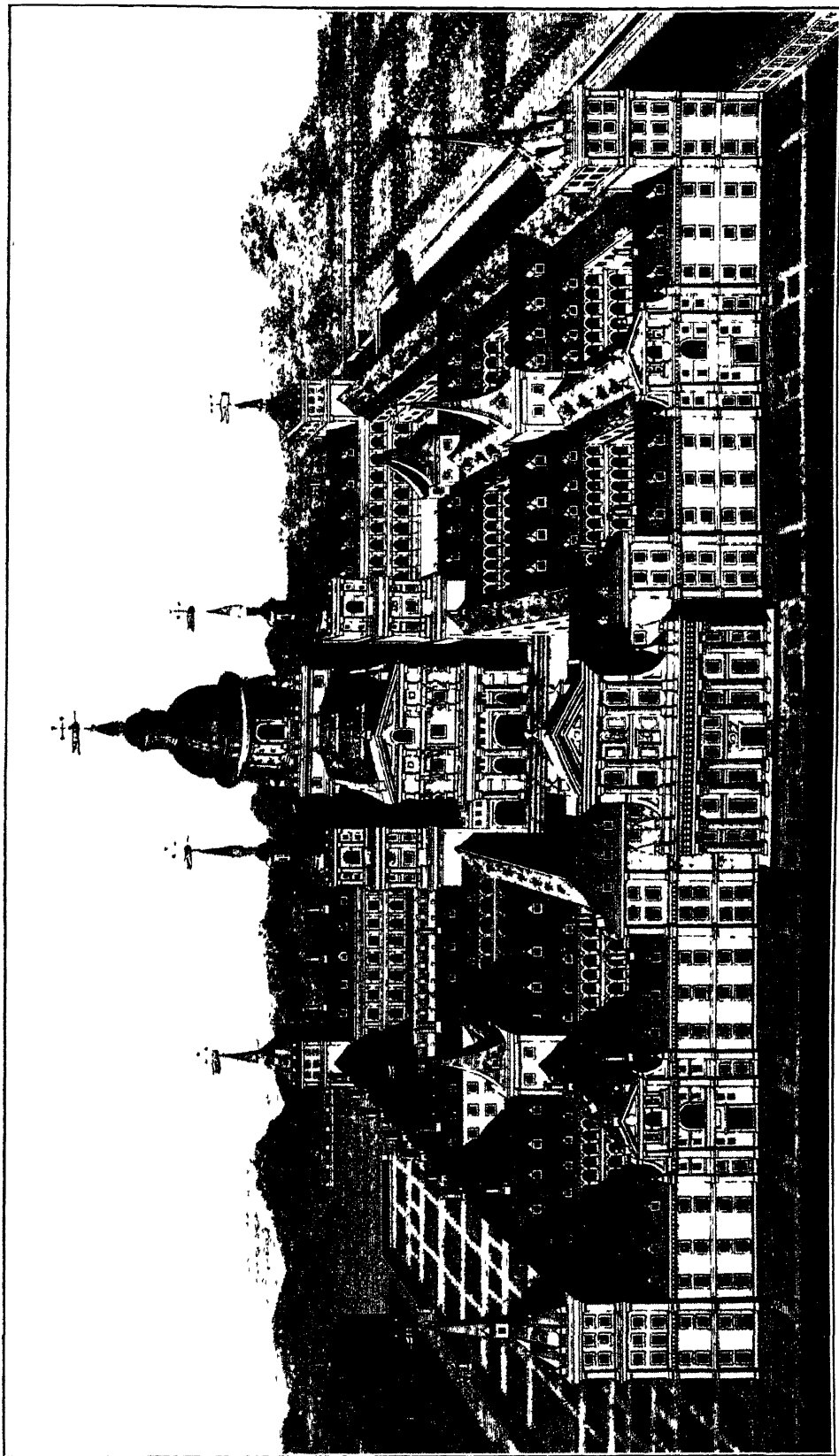
About the same time a German military artist, Lieutenant Helm, was arrested in England, with his pockets stuffed full of sketches of the fortifications of Portsmouth. The incidents created a state of tension between the two countries, and were regarded on both sides as a confession of activity in naval and military work directed by one against the other.

In Russia, where espionage is practiced almost as a profession, a sensation was created by the discovery that Colonel Ivanho, one of the most trusted members of the Czar's secret police, was really acting as a revolutionary spy. The Government knew that the "underground" publications of several revolutionary groups printed secret circulars of the Department of Police weeks before they were sent to the provincial functionaries. When Vladimir Bourtsseff proclaimed that Azell and Harting, the pretended revolutionaries, were really spies of the Government, he proved it by records from the police department's archives. Nothing more was needed to convince the Government that among its most trusted men was a revolutionary spy. But who was he? There are about 15 members of the inside staff through whose hands pass the Czar's official secrets. All 15 are army officers, most of them colonels, some generals. It was only after the secret service had been put under the microscope of a most searching investigation that Ivanho was suspected, though he vanished before the Government could arrest him. This event, following on the confession of Lopukhin, president of the Police Department, that he was a revolutionary, showed how far the ramification of Russian espionage reached.

Congress, it was announced in Dec. 1910, is to be asked to enact legislation for the punishment of foreign spies. A similar law will also be suggested to the Filipino Assembly. It is the conviction of American army officers that drastic measures of this kind are necessary to put an end to the alleged wholesale spying that is being engaged in by Japanese secret agents wherever the American flag flies. The Japanese question in the Philippines was brought sharply to the surface toward the end of 1910 by the arrest at Manila of a Japanese spy with plans and sketches of the defense of Corregidor Island, which guards the bay, and by the domiciliary search for explosives in the Japanese quarters.

Spiritualism. See PSYCHICAL RESEARCH.

Sports. Archery.—The sport of archery, after a rather up-and-down career in the United States came into its own in 1910 and enjoyed its most popular year. More people engaged in the sport than ever before, while the 32d annual meeting of the National Archery Association of the United States, held 16-19 August at Washington Park, Chicago, was the most successful in the history of the association. Mr. H. B. Richardson, of Boston, broke the American record for the double York round with a score of 1,111, and won the double American round with a total of 1,059. The other two events, the double national round and the double Columbia round, both for women, were



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won by Miss J. V. Sullivan, of Chicago, and Miss L. M. Witmer, of Chicago, with scores of 629 and 733 respectively.

Baseball—The baseball season of 1910 came to an end in October with the series of games to decide the world's championship, when the American League team representing Philadelphia defeated the National League team of Chicago by 4 games to 1. The feature of this series was the remarkable work of Coombs, of Philadelphia, who pitched his team to victory in three of the contests. The respective scores for these games were as follows: Philadelphia, 4 runs, Chicago, 1; Philadelphia, 9 runs, Chicago, 3; Philadelphia, 12 runs, Chicago, 5; Chicago, 4 runs, Philadelphia, 3; Philadelphia, 7 runs, Chicago, 2. The winning team was composed of Strunk, c. f., Lord, c. f., l. f.; Hartsel, l. f.; Collins, 2b., Baker, 3b., Davis, 1b.; Murphy, r. f.; Barry, s. s.; Thomas and Lapp, c.; and Coombs and Bender, p. The average attendance was 24,884 1-5, while the total receipts were \$174,000 for the five games.

The two contenders in the world's series were, as usual, the winners of the pennant struggle in the two leading professional baseball leagues in the United States, the National and the American. Both of these organizations enjoyed highly successful seasons during 1910, the total attendance of 7,279,157 persons going far to attest to the fact that baseball continues to be the most popular outdoor amusement in this country. These figures, too, do not include the hosts of people who witnessed games in the numerous other minor leagues scattered throughout the United States. The final rating of the clubs in the National League, together with the percentages of games won and lost, was as follows: Chicago, .676; New York, .591; Pittsburgh, .562; Philadelphia, .510; Cincinnati, .487; Brooklyn, .416; St. Louis, .412; Boston, .346. In the American League the records were: Philadelphia, .680; New York, .583; Detroit, .558; Boston, .529; Cleveland, .467; Chicago, .444; Washington, .437; St. Louis, .305. The minor leagues, all of which had successful seasons in 1910, are as follows: American Association, pennant winner, Minneapolis; Blue Grass League, Paris; Carolina Association, Greenville; Central Association, Quincy; Central Kansas League, Ellsworth; Central League, South Bend; Connecticut League, Waterbury; Eastern League, Rochester; Illinois-Missouri League, Pekin; Indiana-Illinois-Iowa League, Springfield; Kansas State League, Hutchinson; Nebraska League, Fremont; New England State League, New Bedford; New York State League, Wilkes-Barre; Northwestern League, Spokane; Ohio-Pennsylvania League, Akron; Ohio State League, Portsmouth; South Atlantic League, Columbus; Southern League, New Orleans; Southeastern League, Knoxville; South Michigan League, Kalamazoo; Texas League, Dallas; Tri-State League, Altoona; Virginia League, Danville; Western Association, Joplin; Western Canada League, Calgary; Western League, Sioux City; Wisconsin-Illinois League, Appleton; and Wisconsin-Minnesota League, Eau Claire.

A post season series which ranked almost with the world's series was that played between the "Giants" and the "Yankees," the teams representing New York City in the National and American Leagues respectively. Both these

teams finished second in their respective leagues, so that the series partook of more interest than a mere city championship struggle, and interest ran high throughout the country. First honors went to the National League team, but the full seven games were required before the supremacy was established, the Giants winning four, the Yankees two, and one contest being a tie. The precise scores for the various games, in the order in which they were played, were as follows: Giants, 5 runs, Yankees, 1; Yankees, 5 runs; Giants, 4, Giants 6 runs; Yankees, 4; Giants, 5 runs, Yankees, 5, Giants, 5 runs; Yankees, 1, Yankees, 10 runs, Giants, 2; Giants, 6 runs; Yankees, 3. Throughout the work of both teams was of gilt-edge order, the winners fielding for a team average of .947 for the series and batting .281, while the Yankees fielded .952 and batted .254. Christy Matthewson, the Giants' star pitcher, was the hero of these games almost as much as Coombs was of the world's series. Three times he pitched his team to victory and once, when suddenly called into the breach, turned the tide of almost certain defeat into triumph. No game in which he participated was lost to the Giants. Sharing the honors of the series with him was Devore, the Giants' left fielder. The games were witnessed by 103,033 persons and the total receipts reached \$81,462 50.

The premier batting honors of the two major leagues, carrying with them the prize of an automobile offered by a manufacturing company, fell to Raymond Tyrus Cobb, right fielder of the Detroit American League team, who had an average of .385. The fastest baseball game on record was played during the 1910 season, on 17 September, at Atlanta, Ga., Mobile defeating Atlanta in a full nine-inning game which lasted only 32 minutes. The world's record for the long distance throwing of a baseball which has stood for 36 years, was broken on 9 October at a field day of the Cincinnati and Pittsburgh National League clubs held at Cincinnati, when Sheldon Lejeune, of the Evansville club of the Central League threw a ball 426 feet 6 $\frac{3}{4}$ inches, breaking the previous record by 25 feet 10 $\frac{3}{4}$ inches, while N. Zimmermann, of the Utica Club of the New York State League, established a new world's season record for stolen bases in 1910 by stealing 107 bases in 135 games.

Amateur, intercollegiate, and interscholastic baseball was also extensively played and attended throughout the United States. Owing to the generally disorganized condition of the latter, however, no reliable records can be compiled, but in the realm of intercollegiate baseball, which is the most highly developed amateur branch of this sport, the teams representing Fordham, Georgetown, Holy Cross, Notre Dame, Princeton, Harvard, the University of Michigan, and Yale may be mentioned as of particular excellence.

Basketball.—Throughout the winter of 1910 basketball fully lived up to its long accepted standard as one of the most universally popular indoor sports. In the final game of the Amateur Athletic Union Basketball Championship, played at Chicago on 19 March, Company F, of Portage, Wis., took first honors by defeating the St. Louis Premier Lodge by a score of 36-14. Intercollegiate basketball attracted its usual large following, but, owing to the fact

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that a regular intercollegiate basketball league was not maintained, no official championship was awarded. Columbia, Pennsylvania, Princeton, and Yale, however, came to an agreement, playing several games among themselves and meeting numerous other teams as well. Columbia was generally conceded the premier position, making, as it did in the course of the season, a total of 165 points against 80 for all its opponents combined. Princeton scored 30 to 176 by its combined opponents, Yale 127 against its adversaries' 155, and Pennsylvania 126 to 137 by teams it encountered. Numerous less important games were played in practically all sections of the country by interscholastic and club teams, while professional basketball was also played, attracting a large following.

Billiards and Pool.—The feature of the year 1910 in billiards was the remarkable craze for the three-cushion game which spread throughout the country. An amateur national billiard league, with representatives from the leading cities, was started during the year, while in the professional ranks unusual activity was evidenced. De Oro started the year as the title holder, but before a month had passed his laurels were wrested from him by Eames, the Denver, Col., star, who, in turn, was set down by Tom Hueston, a previous champion, in March. Thus in May De Oro regained the premier position by beating Hueston, and later successfully defended it against Lloyds Jeone. In the last month of the year, however, John Daly furnished the surprise of the season when, playing one of the strongest and most consistent games of the year, he wrested the three-cushion honors from De Oro. The latter, however, holds the pool championship, winning it from Jerome Keogh in a sensational match in which he broke the world's high run record with a total of 81 balls. Calvin Demarest, who held the 182 balk-line championship at the outset of 1910, lost it to Harry Cline, a former three-cushion champion, in February. Then Willie Hoppe, who had long been on the outs with those who control the billiard championships, re-entered competition and swept all before him. He first took the 182 title from Cline and then defeated George Sutton for the 181 honors. George Slosson, the old time expert, challenged Hoppe for the 181 championship only to receive one of the worst beatings of his career. Hoppe thus closed the year with two championships to his credit. He also made many records during the season, but most of them were established under conditions which will not permit of their receiving official rating. The most notable billiard record of the year was set up by George Moore in the three-cushion game when he made a run of 15. The old record of 14, made by Frank Peterson, an amateur, had stood for 25 years.

Bowling.—Bowling continued through 1910 to hold its accustomed place among the most popular and universal of indoor sports. The American Bowling Congress held its tenth annual tournament at Detroit, Mich., on 26 February, the five-man events being won by the Cosmos Club, of Chicago, with a total score of 2,880, the two-man events falling to Deiker and Waterman, of Cincinnati, who bowled over 1,231 pins, and the individual honors being taken by Thomas Haley, of Detroit, with a score of 705. The official bowling season came

to an end with the annual tournament of the National Bowling Association at Baltimore, which extended from 9 to 30 April. On that occasion the Chalmers team, of Detroit, captured the five-man title, their score being 2,917, Burdine and Eckstein, the Washington couple, took the two-man event, with a score of 1,305; while the total of 705 recorded by Tony Prio, of Brooklyn, secured the individual honors. The individual scores of 705 made by both Prio and Haley in 1910 constitute a new individual bowling record. Haley was responsible for the only other new record of 1910 when, in the A B C tournament, he scored a total of 1,961 pins for nine games, an average of 217 8-9 per game.

Boxing.—The year 1910 will go down as a memorable one in the history of boxing. It was marked by the passing of three champions, two by virtue of defeat in the arena and one through a violent death. Boxing once again gained a foothold in New York City, and the issuance of permits to hold limited round contests, with no decisions, served to give the sport a considerable impetus. By far the most noteworthy exhibition of the year was the Jim Jeffries-Jack Johnson, heavy-weight championship contest, fought at Reno, Nev., on 4 July. From the time Johnson acquired the heavy-weight title by defeating Tommy Burns at Sydney, Australia, on 26 Dec. 1908, the public had been clamoring for this match. Jeffries had not entered the prize-ring since 3 July 1905, when he voluntarily retired, being at the time the undefeated heavyweight champion of the world, and the sporting world demanded a settlement of the supremacy. The two men finally met on 2 Dec. 1909, in a Hoboken, N. J., hotel, and signed tentative articles of agreement. The match was secured by G. L. ("Tex") Rickard, a prominent Western mining man, who offered the two pugilists a purse of \$101,000 and the entire moving picture profits, one-third of which net profits was to be refunded to him by the boxers, the largest purse ever offered in the history of the prize-ring. After a great many rebuffs from civic authorities, Rickard finally secured Reno, Nev., as the scene of the match.

From the time the articles had been signed Jeffries had been the favorite in the betting, and throughout the world it was intimated that between \$3,000,000 and \$5,000,000 was wagered on the outcome of this contest. The Fourth of July was scorching hot in Reno, rendering the conditions very trying for the fighters, and the fight itself was a distinct disappointment. From the outset Johnson entirely outclassed his more highly rated opponent. At no stage did Jeffries display any of his accredited speed or skill, and the fight came to an end and Johnson became undisputed heavy-weight champion of the world in the fifteenth round. The total gate receipts amounted to \$270,775, the paid attendance amounting to 15,768, in addition to the 760 complimentary tickets distributed.

Besides Jeffries, the other two boxing champions to lose their crowns during 1910 were Stanley Ketchel, middleweight champion and one of the greatest and most popular fighters who ever wore a glove, who came to his end through an assassin's bullet, and Battling Nelson, long holder of the lightweight title.

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which he wrested from Joe Gans after three hard fights. Gans also died during 1910, succumbing after a long siege of tuberculosis. Nelson went down in defeat before the powerful rushes of Ad Wolgast in a fight at San Francisco on Washington's Birthday, which lasted for 40 fierce, fast rounds. These were the most important fights of 1910. Following are the year's records of the most prominent pugilists in all classes.

"Knockout" Brown: Fights 29, won 7, lost 0, draws 0, no decision 22; Leo Houck: Fights 28, won 11, lost 1, draws 3, no decision 13; "Buck" Crouse: Fights 27, won 16, lost 0, draws 1, no decision 10; "Young" Sammy Smith: Fights 25, won 3, lost 0, draws 0, no decision 22; Dick Nelson: Fights 22, won 5, lost 1, draws 3, no decision 13; Abe Attell: Fights 19, won 7, lost 0, draws 1, no decision 11; Young Erne: Fights 18, won 2, lost 0, draws 0, no decision 16; "Pal" Moore: Fights 18, won 4, lost 1, draws 1, no decision 12; Harry Lewis: Fights 17, won 10, lost 2, draws 2, no decision 3; "Batting" Hurley: Fights 16, won 2, lost 3, draws 2, no decision 9; Ray Bronson: Fights 15, won 11, lost 0, draws 2, no decision 2; Owen Moran: Fights 14, won 3, lost 2, draws 2, no decision 7; "Young" Loughrey: Fights 14, won 3, lost 1, draws 3, no decision 7; Frankie Burns: Fights 14, won 1, lost 0, draws 0, no decision 13; Tommy Murphy: Fights 13, won 1, lost 0, draws 1, no decision 11; Jimmy Walsh: Fights 13, won 3, lost 1, draws 2, no decision 7; Monte Attell: Fights 12, won 4, lost 2, draws 0, no decision 6; Sam Langford: Fights 11, won 8, lost 0, draws 0, no decision 3; Matty Baldwin: Fights 11, won 6, lost 2, draws 2, no decision 1; Tony Ross: Fights 11, won 2, lost 0, draws 0, no decision 9; Al Kubiak: Fights 10, won 2, lost 0, draws 0, no decision 8; Johnny Coulon: Fights 10, won 6, lost 0, draws 0, no decision 4; Jack "Twin" Sullivan: Fights 10, won 2, lost 3, draws 0, no decision 5; "Cyclone" John Thompson: Fights 9, won 8, lost 0, draws 0, no decision 1; Jack Goodman: Fights 9, won 1, lost 0, draws 0, no decision 8; Filie Lewis: Fights 9, won 1, lost 2, draws 2, no decision 4; Frank Klaus: Fights 9, won 1, lost 2, draws 2, no decision 4; Frankie Conley: Fights 9, won 4, lost 0, draws 1, no decision 4; Joe Jeanette: Fights 7, won 2, lost 1, draws 0, no decision 4; Sam McVey: Fights 7, won 6, lost 0, draws 1, no decision 0; Tony Caproni: Fights 7, won 5, lost 1, draws 1, no decision 0; Lew Powell: Fights 7, won 2, lost 0, no decision 5; Billy Papke: Fights 6, won 5, lost 1, draws 0, no decision 0; Ad Wolgast: Fights 6, won 1, lost 0, draws 0, no decision 5; Stanley Ketchell: Fights 5, won 3, lost 0, draws 0, no decision 2; "Batting" Nelson: Fights 5, won 2, lost 2, draws 1, no decision 0; Packey McFarland: Fights 5, won 2, lost 0, draws 0, no decision 3; Jimmy Gardner: Fights 5, won 1, lost 1, draws 0, no decision 3; Al Kaufman: Fights 5, won 1, lost 0, draws 0, no decision 4; Freddie Welsh: Fights 4, won 3, lost 0, draws 1, no decision 0; Jem Driscoll: Fights 4, won 3, lost 1, draws 0, no decision 0; Hugo Kelly: Fights 4, won 3, lost 0, draws 0, no decision 1; "Digger" Stanley: Fights 4, won 3, lost 0, draws 1, no decision 0.

Chess—The year 1910 in chess was made memorable by several important games. In a match between Dr. E. Lasker and Carl Schlech-

ter, of Vienna, in which the world's championship was at stake, Doctor Lasker, the present holder of the title for the first time in his career failed to defeat his opponent. He retained his honors, however, by drawing with his opponent. The play, which took place at Vienna and Berlin, consisted of ten games. The first four were drawn, then Schlechter won the fifth and maintained his advantage by drawing the next four games. In the last game, however, Dr. Lasker exhibited some remarkable work and, winning it, held his title. Later, in a series at Paris, Dr. Lasker disposed of his only other important challenger, D. Janowski, by a score of 7 games won, and 1 lost, and 2 drawn. Schlechter, after extending Dr. Lasker to his limit, had little trouble in capturing the honors in the International Chess Congress at Hamburg in August. In this tournament Frank J. Marshall, chess champion of the United States, tied with R. Feichmann for fifth place. Marshall made a tour of the United States and in a championship match at Lexington, Ken., won from J. W. Showalter by a score of 7 games to 2, with 3 drawn. Marshall also captured the championship of the Manhattan Chess Club. In the international cable matches Great Britain defeated America for the second consecutive time, the score being 6½ to 3½. The American team was composed of F. J. Marshall, J. F. Berry, A. B. Hodges, H. S. Voltz, G. H. Wolbrecht, S. L. Stadelman, G. L. Schwetizer, R. T. Black, H. Rosenfeld, and L. B. Meyer, while Great Britain was represented by J. H. Blackburne, H. E. Atkins, T. F. Lawrence, V. L. Waight, F. D. Yates, G. E. Wainwright, W. Ward, J. H. Blake, G. A. Thomas, R. P. Michell. American honor in chess, however, was upheld by the composite American college team which in the other international cable match won from the joint Oxford-Cambridge team by a score of 4½ to 1½. The American team was made up of N. T. Whitaker, J. R. Chandler, L. W. Stephens, L. Tolins, G. Burgess, and H. L. Bander. R. Lob, J. M. Bee, A. P. Waterfield, G. H. Stephens, H. M. Bewley, and E. Southwell composed the English team. In American intercollegiate circles the championship resulted in a tie between Yale and Harvard, which two subsequent matches failed to break, both resulting in draws. Third and fourth places went to Columbia and Princeton, respectively. The University of Pennsylvania took the honors in the annual tournament of the Triangular College Chess League with a score of 6½ to 1½, the other places being distributed as follows: second, Cornell, 5½ to 2½; third, Brown, 0 to 8. The State Championship at the New York State Chess Meeting, held on Washington's Birthday, was won by J. R. Capablanca, with C. Jaffe second. A new departure, in 1910, of great interest to chess lovers was the installation of four lectures on the subject of chess in the lecture course of the Brooklyn Institute of Arts and Sciences. These were delivered by Albert B. Hodges, former United States chess champion, and Hermann Helen, ex-New York State champion.

Cricket—In America, cricket continued during 1910, as previously, to be a game played only by the select few. The most important cricket organization in the United States, the New York and New Jersey Cricket Association, comprising six clubs, had an averagely success-

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ful season, the championship being won by Staten Island, which did not lose a match, and second and third places going to the New York Veterans and Richmond County, respectively. M. R. Cobb, of Staten Island, had the highest individual batting average in the league and D. S. Birkett, of Bensonhurst, the highest bowling average. The championship of the Metropolitan District Cricket League was won in both sections by the Brooklyn. Several matches were also played during the year between United States and Canadian teams, chiefly by the Belmont Cricket Club, of Philadelphia. That organization defeated the Toronto Cricket Club, played a tie match with Ottawa, and then, after losing to Montreal, defeated the Merion Cricket Club for the Halifax Cup by a score of 383 to 183. Staten Island drew with Ottawa and won from Belmont by a decisive margin. In England where cricket occupies a position in sport similar to that of baseball here, the county championship for 1910 was won by Kent, with 19 victories, 3 defeats, and 3 tie games.

Curling.—The principal event of the 1910 curling season was the contest at Duluth, Minn., on 15 January, when a team, composed of five United States rinks defeated an equal representation of Canadian curlers by a score of 66 to 40. The winners of the Northwestern bonspiel, decided at Duluth four days later, were as follows: Grand aggregate, H. T. Hurdon; Duluth Curling Club event, G. P. Reedal; St. Paul Jobbers Event, H. I. Hurdon; Western Curling Club event, Dr. L. J. Tucker; Canadian Soo Event, W. S. Hall; International Event, Dr. L. J. Tucker; Ordway Event, Dr. A. R. Lenont—all of whom were United States entries. The contest for the John Patterson Medal at New York City, on 26 February, between the Scots and the Americans, was won by the former by a score of 109 to 46.

Cycling.—The cycling season of 1910 did not attract so much interest in this country as did its predecessor, although it retained its usual strong following abroad. The first important event occurred on 2 January when at Berlin, Germany, a 2-man team 6-day race was won by Walter Rutt, of Germany, and J. Clarke, of Australia, with a score of 2,332½ miles. On 5 March, at Brooklyn, N. Y., a similar race in which, however, the men rode only ten hours daily, was captured by the Boston couple, Droback and Hill, who covered 1,353 miles and 8 laps. The biggest 6-day race of the year, that at Madison Square Garden, New York City, which came to an end on 10 December, went to Root and Moran, who covered 2,545 miles 3 laps, thereby winning from the Rutt-Clarke team by a slight margin in one of the most sensational races on record. The winners' purse on this occasion was \$1,600. At Brussels, Belgium, on 25 July Georges Parent won the world's professional 100-kilometer paced championship in 1 hour 22 minutes 33 4-5 seconds, while the world's professional 1,000 metres title went to G. Friol, of France. H. Hens captured the world's amateur championship for 100-kilometers in 1 hour and 22 minutes 46 4-5 seconds, and the world's amateur 1,000-meters honors went to W. J. Bailey in the excellent time of 1 minute 45 2-5 seconds. On 22 August Joe Noe, of the Wheel Club of America, set a new record for the ride from

New York to Philadelphia and return by covering the ground in 13 hours 58 minutes.

Fencing.—The winners in the various classes at the 1910 championships of the Amateur Fencers' League of America, on 23 April were as follows. Foils: George K. Bambridge; duelling swords: A. W. Dela Poer; sabres: Joseph G. Shaw; foils, junior championship: Dr. J. E. Gigtraux. The intercollegiate championships, which were held 26 March, resulted in a victory for Annapolis, with West Point second and the University of Pennsylvania third, while the intercollegiate individual championship was won by Harry F. Wendel, of the latter institution. The championship of the United States Army at Broadwords was won by Corporal J. D. Lohmann, of 115 Company, Coast Artillery.

Football.—The football season of 1910 was, to probably a greater extent than any other in the history of the sport, a season of surprises. Team after team encountered supposedly weaker opponents, only to go down in defeat, until in the minds of the critics the only thing to be expected was the unexpected. This condition makes any impartial ranking of the various teams extremely difficult. Most of the experts, however, agree that Harvard had the best team in the country. The crimson team went through the early stages of the season running up uniformly large scores until it encountered West Point, which it defeated with great difficulty by the small score of 6-0. The following Saturday Harvard won from Cornell by a score of 27-5, and the five points scored by Cornell on that occasion were the only ones registered against the Cambridge team. After Harvard defeated the strong Dartmouth combination 18-0 her place as the leading team seemed established and she entered her final game with Yale a strong favorite. Yale was credited with having one of the worst teams in the history of the college. Her work had been erratic throughout the season, West Point having beaten her 9-3, such a small college as Vanderbilt having held her to a scoreless tie, and Brown having administered one of the worst drubbings of the season when she won from the blue by a score of 21-0. In the game with Princeton, however, Yale took a sudden brace and succeeded in beating the Tigers, previously rated as among the best teams in the country, by the close score of 5-3.

The Yale-Harvard contest, played at New Haven the Saturday before Thanksgiving, was, as usual, the biggest game of the year. Nearly 40,000 persons, gathered from all quarters of the United States, witnessed the play, which was fierce and spirited throughout. Neither team was able to score and the contest ended with a 0-0 result. In spite of her failure to run up any points, however, Harvard showed herself the superior almost from the outset, and it was only Yale's wonderful fighting spirit that kept her from crossing the blue goal line. It is for this reason that critics accord Harvard the first place in football among the colleges. In John R. Kilpatrick, Yale is almost universally admitted to have had the greatest individual football player of the year, and despite this fact and her improved showing in the Harvard and Princeton contests, Yale's ranking for the season must remain comparatively low. The season came to

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an end the Saturday after Thanksgiving Day with the Army-Navy game, bringing together the West Point and Annapolis teams at Franklin Field, Philadelphia. The Navy won, 3-0, thereby becoming the only large team in the country which went through the entire season without being scored upon. Pittsburg University, not as well known in football circles, also showed a clean slate, but she did not meet such formidable opponents as did Annapolis. The Army-Navy game was witnessed by a record crowd, in which were included a host of military, naval, and governmental officials, so that the event maintained its rank as one of the most picturesquely unique social features of the sporting world.

Of the smaller colleges Brown commanded particular attention. Colgate held her to a scoreless tie, and Pennsylvania and Harvard both defeated her, the scores being 20-0 and 12-0 respectively, but against these must be placed the enormous totals she ran up against Yale, Tufts, Vermont, and the Massachusetts Agricultural College. Pennsylvania had a highly successful season, and was generally ranked second only to Harvard on the season's work. After inaugurating the year with an unaccountable 8-5 defeat at the hands of Ursinus, Pennsylvania found herself and went through the season without a subsequent defeat, her most notable victories being over Brown, the Carlisle Indians, Lafayette, and Cornell; a scoreless tie was also played with the University of Michigan. This, together with the Cornell-Chicago contest, won by the former, 20-0, furnished about the only basis of comparison between Eastern and Western football. Michigan was admittedly the best team in the West, with Minnesota not far behind. Of the other important teams, Princeton was supposed to be usually good until, in her final game, she suffered the unexpected set-back at the hands of Yale. Pendleton, one of her half-backs, was Princeton's main strength and it was largely through his work that the Tigers defeated both Carlisle and Dartmouth by the same score, 6-0. Dartmouth also had a fairly good season, defeating Vermont 33-0, and Amherst 15-3, but the defeats administered by Harvard and Princeton had a tendency to lower the green's stock.

Before the football season of 1910 began the playing rules were thoroughly overhauled with a view to minimizing injuries to players. A great deal of protest against the sport had arisen during 1909 owing to the 32 deaths and 84 injuries, besides thousands of minor ones, resulting to contestants. In 1900 that appalling number was cut down to 14 deaths and 42 injuries, but this was by no means satisfactory to the critics of the sport and there is no doubt but what, before the fall of 1911 starts another season of football, still more vigorous changes will be enforced in the playing system. None of the deaths or serious accidents, however, occurred in one of the large colleges where the players understand the game thoroughly and are put in almost perfect physical shape before being permitted to participate in a contest. The new rule permitting a player to be taken out of play and then substituted again at any time was given most of the credit for the reduction in injuries, together with the abolition of the old style "mass plays." There

were still some unsatisfactory points, however, in the new rules, notably the division of play into four periods instead of two, as had always previously been the custom—an innovation particularly disagreeable to the players themselves—and the difficulty of gaining 10 yards in three downs under the numerous restrictions imposed by the revised code. These points, together with various technicalities of interest only to the players themselves, will receive especial attention from the rules committee before another playing season. Popularly the sport fully held its own during 1910.

Golf—Golf was never more popular than in 1910, when a vast army of men and women on courses in every section in the United States engaged in competition or else played for exercise or amusement. W. C. Founes, Jr., of Pittsburg, for some years a golfer who has displayed consistent excellence and many times has only just missed attaining the blue ribbon among amateur golfers, attained his ambition in 1910, when he captured the amateur championship at Brookline, Mass., from an unusually strong field. However, although the championship honors fell to Founes, there are many experts who regard Charles W. Evans, Jr., of Edgewater, as the finest amateur in the country. He particularly distinguished himself in 1910, by winning the Western open championship, which began with a qualifying round and terminated with match play. By defeating all comers here and gaining first honors, Evans accomplished a feat never before performed by an amateur golfer. Besides this notable triumph he also established many new course records in the course of his season campaign. Miss Dorothy Campbell, the Scotch girl now residing in Canada, again established her right to the Woman's Championship, and in doing so incidentally set up a record of 78 for the Homewood Country Club course.

"Alex" Smith, of New Rochelle, N. Y., regained the title of national open champion in a tournament at the Philadelphia Cricket Club, which brought together the pick of both the amateurs and professional ranks. A remarkable feature of this competition was the fact that three men were tied for first honors. McDonald Smith, of California, and J. J. McDermott, of Merchantsville, N. Y., being the two with whom Alex Smith was forced to divide his glory. The playing of the last named was one of the sensations of the seasons, owing to the fact that up to 1908 his only connection with the sport had been as a caddy-boy. Of the other important tournaments played in this country during 1910, James Maiden captured the Eastern Professional Championship; Frederick Herreshoff won the Metropolitan Championship and Miss L. B. Hyde the Metropolitan Woman's Championship; Max Behr annexed the New Jersey State title, while the Vermont, Pennsylvania, Florida, and Southern Florida championships fell to O. C. Holden, W. C. Founes, Jr., W. B. Averill, and W. Fairbanks, respectively. The North and South Open Championship went to Alexander Ross, and the North and South Amateur to W. J. Travis, the well known veteran. M. E. Phelps established his supremacy in the Western Amateur Championship, as did Mrs. Thurston Harris in the Western Woman's Championship. In intercollegiate golfing circles Yale was the 1910 winner, with Princeton sec-

ond, while the intercollegiate individual honors were won by R. E. Hunter, a Yale man. The English Amateur Championship was won by G. Ball and the English Open Championship by J. Braid. That the quantity of golf exhibited great improvement may be realized from the fact that new course records were established by amateurs in 108 different instances, while professionals set up 88 new marks and women 15.

Gymnastics.—On 28 April the Amateur Athletic Union National Gymnastic Championships were held at New York City. The individual all-round title was won by Frank Jirasek, of the Gymnastic Association Tyrs, Cedar Rapids, Ia., who had a total of 3281. The Bohemian Gymnastic Association captured the club championship with 13 points, while the individual honors in the various events were won by the following athletics: Rope climbing: Theodore Anastas, of the Washington Heights, N. Y. Y. M. C. A.; Indian club swing: J. D. Harris, of the Pastime Athletic Club; flying rings: J. D. Gleason, of the West side (N. Y.) Y. M. C. A.; parallel bars: F. Jirasek; side horse: A. Klar, of the Bohemian Gymnastic Association; Tumbling: H. Jachnal, of the Newark, N. J. National Turn Verein; long horse: W. Heisler, of the Bohemian Gymnastic Association; and horizontal bars: P. M. Krimmel, of the New York Turn Verein. The Intercollegiate Gymnastic Championship for 1910, held at Princeton, N. J., was won by Yale, with 20 points; Princeton finishing second, with 16 points, and Rutgers, third, with 8 points. See also PHYSICAL CULTURE.

Hockey.—Unusual interest was exhibited in hockey throughout the winter of 1910. The eastern championship was won for the second successive year by the New York Athletic Club, which finished its season with 7 victories and only 1 defeat. The Phoenix team of St. Paul captured the Twin City Hockey League championships, while the title in the Boston Hockey Association went to the Crescent Club. Princeton took the highest intercollegiate honors. In Canada where this sport has reached probably its highest stage of development, the Wanderers won the championship of the Canadian Professional Hockey League, finishing the season with 11 victories and 1 defeat to their credit.

Ice Yachting.—The season of 1910 in ice was an unusually active one, fourteen important series of races being held during the months of January and February. The season's principal winners were E. A. Hay's *Daisy*, which won the 10 and 12 mile races, and the 10-mile race for the Powers Cup, all at Red Bank, N. J., and Edward Fielder's *Drub*, which captured the races for the Board of Trade Cup at Long Branch, N. J., on 24 January, for the Robert Wilson Cup on 8 February, for the second Commodore's Cup on 11 February, and for Porter Cup on the same date. All these races were over a 15-mile course at Long Branch, N. J. Both the 20 and 10 miles championship pennant races over the Red Bank course on 11 January were won by *The Imp*, while the yacht *Princeton*, which changed owners during the season, had a highly successful year, taking the honors in first 15-mile Commodore's Cup Race on 27 January, as well as in the match race over the same distance on 9 February, and the second 15-mile race for the Irwin Cup. Other

good boats were Walter Content's string, which showed the way to all comers in the 27 January 15-mile Board of Trade Cup Race, the 4 February Robert Morris Cup Race, and the Prince's Cup Race on 11 February as well as in several minor contests. *Jack Frost*, owned by J. M. O'Brien, was still another speedy craft, winning the Porter Cup on 26 January, and the 9 February Wilson Cup Race. C. P. Irwin's *Georgie* capture the Irwin Cup for 15 miles on 9 February, while other notable yachts of the year were J. E. Greene's *Eagle*, J. C. Gibbon's *Ingenue*, and the Rogers string. No records were broken in the ice yachting during 1910, and the craft has not yet put in an appearance which can hope to compete with the Kalamazoo Ice Yacht Club's *Wolverine*, the boat that on 24 Feb. 1907, broke all world's records for a two point course by sailing 20 miles in 39 minutes 50 seconds.

Lacrosse.—Organized lacrosse playing in the United States during 1910 was confined almost entirely to the colleges. The United States Intercollegiate Lacrosse League is divided into two sections of four teams each, the first consisting of Swarthmore, Johns Hopkins, Lehigh, and Stevens; and the second of Harvard, Cornell, Hobart, and Columbia. For the season of 1910 the teams in the respective sections finished in the order named, both Swarthmore and Harvard winning all their games.

Polo.—Polo received a considerable impetus in the United States during the year 1910 through the visits to this country of two English teams, the Ranelagh Club, champions of England, and the Hurlingham Club, easily among the best polo aggregations on the other side of the Atlantic. The latter team, made up of Captain Belleville, Captain de Crespigny, W. Buckmaster, and Captain Miller, played three matches in this country and succeeded in winning them all. On 24 March at Coronado, Cal., this club defeated the American Burlingame Club by 8 to 4 for the championship of California and the Spreckel's Cup. Four days later Hurlingham took the measure of the same club to the tune of 9 to 1 in a match in which the American Cup was at stake, and at Lakewood, N. J., on 9 April, they met the crack Meadow Brook outfit, and, although forced to their utmost limit all the way, finally won out by a score of $5\frac{1}{4}$ to 4. The Ranelagh Club inaugurated its American invasion with a defeat by the score of $6\frac{1}{2}$ to 4 at the hands of a picked team of Americans to whom, however, the Englishmen had allowed a handicap of 4 goals. The Ranelagh Club also lost its two following games, played on 15 and 20 August respectively, losing to Point Judith by 11 to 8, and to Meadow Brook in the final for the Point Judith Cup by a score of $10\frac{3}{4}$ to $4\frac{1}{2}$. Both these games were played on an even footing. Ranelagh conceded 17 points to the New Haven 2d team on 22 August, and then in a whirlwind game pulled out the contest 18 to $16\frac{1}{2}$, and two days later it had its revenge on Point Judith, sending the latter down to defeat by a score of 8 to 1. On 25 August, Ranelagh, although outplaying Bryn Mawr all the way in the contest for the Narragansett Cup, lost $14\frac{3}{4}$ to $12\frac{1}{2}$ by virtue of the 10 goal handicap conceded to the local team. Two days later, however, the Englishmen won the final in the National Championship, winning from the Perroquet

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Club, $7\frac{3}{4}$ to $3\frac{3}{4}$. Then, after defeating a picked American team, $9\frac{1}{2}$ to $4\frac{1}{2}$, Ranelagh engaged in a series of three games with the Meadow Brook Club, the first of which was played at Newport, R. I., and the last two at the Meadow Brook grounds, Westbury, L. I. The Americans won the second contest by a score of $9\frac{1}{4}$ to $7\frac{1}{2}$, while the first and last games went to Ranelagh by scores of 12 to $6\frac{3}{4}$ and 6 to 5, respectively. The Ranelagh Club wound up its American tour on 14 September by defeating the Rockaway Club 10 to 8. The English team was composed of Lord Grosvenor, R. Grenfell, F. A. Gill, and Earl Rock-savage. The National Junior Championship of the United States was won by the Myopia 2d team at Narragansett Pier on 30 July.

Roller Skating.—The 1910 roller skating season marked a general shattering of records. In a half mile race at Chicago, Ill., on 3 January, Fred Tyrell set three new amateur world's records, covering 100 yards in 10 seconds, $\frac{1}{4}$ mile in 30 seconds, and $\frac{1}{2}$ mile in 1 minute 15 seconds. On 20 January the latter record was lowered by Allie Moore, who, in a match race with Tyrell, finished in 1 minute 14 1-5 seconds. Eight days later Moore broke his own $\frac{1}{2}$ mile record, setting the mark at 1 minute 13 1-5 seconds. On 6 February, competing at Evansville, Ind., Robert Vize established a new world's endurance record by skating 26 hours 51 minutes without stopping. Two days after this the World's 1-mile professional record was reduced to 2 minutes 49 1-5 seconds by J. N. Mason, only to be again lowered on 9 February to 2 minutes 48 3-5 seconds by Clarence Hamilton, who, in turn, had his record taken away from him the following day when Rodney Peters skated 1 mile in 2 minutes 46 2-5 seconds. This sensational series of races occurred at the National Professional Roller Skating Championships, at Pittsburg, Pa. On 11 February the big Denver 24-hour endurance contest was captured by Thomas J. Waters, who covered 186 miles, while another 1 mile professional championship race at Cincinnati, O., on 4 March, went to Harley Davidson, although this time the record remained intact, the winner's time being 2 minutes 49 1-5 seconds. Davidson recorded another important victory on 31 March, after journeying to London, England, he defeated Al Moore over a 1 mile course in 3 minutes 2 2-5 seconds. Moore turned the tables on him three days later, however, by winning the 2 mile event in 6 minutes 45 4-5 seconds. The world's professional record for this event was broken at Kansas City, Mo., on 8 April by Clarence Hamilton, who covered 2 miles in 5 minutes 37 4-5 seconds. Hamilton followed up this great performance by gaining the 1 mile title when at Chicago, on 24 April he skated that distance in 2 minutes 27 3-5 seconds, at which mark the world's record now stands. The other important roller skating events of 1910 were the winning of the 5-mile eastern professional championship in 16 minutes 33 1-5 seconds by Harry Burke, of Bridgeport, Conn., and the winning of the final 1-mile championship contest by Fern Hamilton, of Boston, whose time was 2 minutes 32 1-5 seconds.

Rogue.—The National Rogue Tournament of 1910, held at Norwich, Conn., 16-22 August, was the most largely attended and altogether

successful ever held in this country, evidencing the growing popularity of this sport. Harold Bosworth, of New London, won the honors in the first division, J. Felton, of Philadelphia, in the second, and E. E. White, of Willimantic, in the third. In the Central Association championships H. Cramer was the victor in the first division and the Rev. Mr. Zartman in the second.

Rowing.—During its season of 1910 rowing enjoyed a highly successful period. The most popular rowing race in this country was the Yale-Harvard four mile contest, rowed at New London, Conn., 30 June. This proved an absurdly easy victory for Harvard, who finished a full 10 lengths ahead of her rival in the excellent time of 20 min 46 $\frac{1}{2}$ sec. The winning eight was made up of R. Whitney, bow, G. F. Newton, Jr., No. 2, G. O. Metcalf, No. 3; L. Withington, Jr., No. 4; E. C. Bacon, No. 5; A. Strong, No. 6, J. E. Waid, No. 7; R. C. Cutler, stroke, and A. K. MacGregor, coxswain. Harvard also won the four-oared and freshman races, both of which were two miles in length. In the Intercollegiate races at Poughkeepsie, N. Y., 25 June, which brought together crews representing Cornell, Pennsylvania, Columbia, Syracuse, and Wisconsin universities, the contestants finished in that order in the main right-oared event of four miles. The winner's time was 20 min 42 1-5 sec. Cornell made a clean sweep of the three races, as did Harvard at New London, by also capturing the freshmen and four-oared contests. In the eight-oared race at Poughkeepsie, Pennsylvania proved the greatest surprise, forcing Cornell to her utmost to win and wresting second place from Columbia, who by many had been picked to win the event. Enormous crowds gathered from all sections of the country, witnessed both the Poughkeepsie and New London races from observation trains which followed the course of the spreading crews, from private yachts and from shore.

The championships of the American Association of Amateur Oarsmen were decided on the Potomac at Washington, D. C., 12-13 August. William Mehrhoff, of the Nassau Boat Club, on this occasion leaped to the first flight of amateur oarsmen by winning the senior single sculls at both a quarter-mile and a mile. In the short dash Mehrhoff defeated the old Veteran, Fred Fuessel, of the Harlem Boat Club, while in the longer event he disposed of Fred Shepherd of the same organization. In the quarter-mile dash Mehrhoff was forced to establish a new American record of 1 min 24 $\frac{3}{4}$ sec in order to win. In the senior eight-oared race the Ottawa Rowing Club took first honors after a hard race with the Argonaut Rowing Club of Toronto, and the Vespers of Philadelphia.

Of the English rowing events the Henley attracted especial attention. Here the Wyfold challenge cup was won by Trinity Hall, Cambridge, the Ladies' challenge plate, by Eton College, Oxford; the Diamond challenge sculls, by W. D. Kinnear, of the Kensington Rowing Club; the Grand Challenge cup by Magdalen College, Oxford; the Stewards challenge cup, by the Anglian Boat Club; the Silver goblets, by the Leander Rowing Club; and the Visitors' challenge cup, by Trinity Hall, Oxford. The classic Oxford-Cambridge eight-oared four-mile

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race was rowed over the old Thames course on 23 March. This event was captured in 1910, by the Oxford crew, which covered the four miles in 20 min 14 sec.

Ski Jumping—Ski jumping tournaments, both amateur and professional were popular during January and February of 1910. Meetings held during those months at Red Wing, Minn., Chippewa Falls, Wis., Stoughton, Wis., Chicago, Ill., Eau Claire, Wis., Coleraine, Minn., and Marquette, Mich., all called forth good sized lists and produced uniformly high grade performances. The most notable ski jumping event of the year occurred on 22 February, when August Nordby, of Superior, Wis., established a new American professional record with a leap of 140 feet.

Soccer Football—Soccer football, although by no means ranking as one of the major sports, was played more or less in the East during 1910. The New York State League championship was won by Clan MacDonald after a stubborn, season-long fight with Hollywood Inn. The latter, however, succeeded in capturing the New York State Cup competition, while the American Cup was won by the Tacony Football Club of Philadelphia. The Fall River, Mass., Rovers won the Eastern League, while the Interstate League title was taken by Clan McDuff, of New York. The champion among the few American Colleges who follow this sport was Columbia, followed, in turn, by Yale, Harvard, Haverford, Pennsylvania, and Cornell. The Pilgrims, a strong English team, journeyed to this country and played series of games with all the principal teams here, finishing with a collective total of 123 goals to their opponents 13. Although several American clubs managed to tie the Pilgrims upon occasion, only two, the Philadelphia Hibernians and the Fall River Rovers, succeeded in beating them. In England, where soccer forms one of the chief sports, Aston Villa won the championship in the first Division of English League and Manchester City in the second. In the international matches played abroad Scotland defeated England, 2-0, while England took the measure of France by a score of 10-1 and of Switzerland to the time of 6-1. In England's great intercollegiate match, Oxford won from Cambridge by 2 to 1, Barnsley and Newcas the United tied in the final for the English cup with 1 goal each.

Squash Racquets.—The individual squash racquets championship of the United States for 1910 was won by Dr. J. A. Miskey, who held the title in 1909. The Metropolitan Championship was captured by the team representing the Harvard Club. A series of intercity matches between Philadelphia, Boston, and Baltimore, was conclusively won by the latter.

Swimming.—Charles M. Daniels, of the New York Athletic Club, who has been competing in championship swimming races for six years, still stands out as the king of all swimmers, for the year 1910 did not succeed in developing anyone who can properly be classed as his peer. The "Human Fish," as Daniels is called in sporting circles, holds every record from 25 yards to 1 mile. During 1910 he confined his attention chiefly to the shorter distances. The Amateur Athletic Union Championship swimming competitions were held in various parts of the country, one or more events being al-

lotted to each club. New York, Chicago, and St Louis were the scenes of the most interesting contests. Aside from Daniels, the men who particularly distinguished themselves in swimming during 1910 were L. B. Goodwin, of the New York Athletic Club, in the distance events; M. McDermott, of the Illinois Athletic Club in breast stroke swimming, George Gaidzik, of the Chicago Athletic Association, in fancy and high diving, C. Brown, of the Illinois Athletic Club, in plunging, and H. Hebner, of the Illinois Athletic Club, in backstroke swimming. Intercollegiate swimming received more attention than ever before, both an indoor and an outdoor championship being held. New intercollegiate records were made W. Howe, of Yale, in the 50-yard event, John Shryock, of Pennsylvania, at the 100-yards, and Robert Loree, of Yale in the plunge for distance. Yale, Pennsylvania and Princeton carried off most of the honors of 1910 in intercollegiate swimming and water polo. The latter was also extensively played by the more expert amateurs, the New York Athletic Club, Illinois Athletic Club, and Chicago Athletic Association all having unusually strong teams.

The new records which Daniels established during 1910, all of which were bath records, are as follows: 50 yards, 2 turns. 24 2-5 seconds; 100 yards, 4 turns. 54 4-5 seconds, 100 meters, 4 turns. 1 minute 2 4-5 seconds, 200 yards, 7 turns: 2 minutes 14 seconds; 250 yards, 9 turns: 2 minutes 55 3-5 seconds; 300 yards, 11 turns: 3 minutes 35 4-5 seconds; 300 meters, 13 turns: 3 minutes 57 3-5 seconds.

Tennis—The year 1910 in tennis showed little change in the leading figures from the year before, although there was a decided indication of a revision in the lists of champions before another year is over. Numerous important tournaments were held throughout the country, principally in the East, and most of the prominent players competed in all of them. The work of all the leading contestants was generally consistent, so that a list of the first dozen men in each of these tournaments would read pretty much the same. The tournament in which the greatest interest centred, however, and the one which attracted by far the greatest attention was the annual national championship, played at Newport, R. I. This was won by William A. Larned for the sixth time in his career. The national doubles championship was again won by F. B. Alexander and H. H. Hackett, while Miss Hazel Hotchkiss found no trouble in gaining first place among the women players, and Jay Gould in the court game won his fifth championship in a style that proved him to be in a class by himself at this style of tennis.

The national championship brought together 181 players, the largest field in the history of lawn tennis in America. Larned, owing to the fact that he had won the title the year before, was obliged to meet only the winner of this field. The latter was Thomas C. Bundy, the sensational youngster from the Pacific Coast, who demonstrated his mastery of the game by defeating the best of the eastern players, including such an expert as Beals Wright, in the course of the national competition. The severe strain under which this had placed him sent Bundy into the final match with Larned very tired, and the fact that he was facing an

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entirely fresh man made his task doubly difficult. Even under these conditions, however, Bundy succeeded in forcing his older opponent to play the full five sets in order to win, and there were many who believed that the Westerner, had he been as fresh as his adversary, could have won. The final score in Larned's favor was 6-1, 5-7, 6-0, 6-8, 6-1. The result of the match caused so much general comment that it is expected in 1911 the previous year's winner will be forced to play through the entire tournament, exactly as do the other contestants.

The West seems to be assuming a more and more important place in the American lawn tennis world, and indications are that it is to that section that the public must look for new champions. Aside from Larned and Hackett and Alexander, the quartet of Pacific Coast players, consisting of Bundy, Maurice McLoughlin, Carleton R. Gardner, and Melville Long proved themselves easily the best in the country, and one after another the older Eastern experts were forced to bow to the slashing, brilliant play of these young men. Melville Long, among other notable achievements, won the national clay court championship. The playing of this tournament was one of the distinctly novel features of the year 1910 in tennis, it having been the first competition of the sort where a national championship was at stake ever held in the United States. In the final match Long defeated Walter M. Hall in straight sets, 6-0, 6-1, 6-1. The important Longwood tournament was won by McLoughlin, who defeated Beals Wright in the finals, while Larned captured the Metropolitan championship from G. F. Touchard.

The Davis International Lawn Tennis Trophy was not competed for in 1910. This cup is now in the possession of Australia, who captured it from Great Britain. The rules of competition provide that matches for the trophy shall be played in the country holding it at the time. Both Great Britain and the United States challenged and were ready to send competing teams, but at the last moment it was discovered that business interests of the various leading players would make it impossible for them to consider such a long trip. Nevertheless, tennis in the United States attracted more patronage, attention, and contestants than ever before, and was altogether regarded as one of advancement in this sport. The following is the official ranking of the leading players for the year 1910:

Singles: 1, W. A. Larned; 2, Thomas C. Bundy; 3, B. C. Wright; 4, M. E. McLoughlin; 5, M. H. Long; 6, N. W. Niles; 7, G. F. Touchard; 8, T. R. Pell; 9, F. G. Colston; 10, C. R. Gardner.

Doubles: 1, Hackett and Alexander; 2, Bundy and Hendrick; 3, Whitney and Bishop; 4, Larned and Wrenn; 5, Niles and Dabney; 6, Bull and Martin; 7, Waidner and Gardner; 8, Watson and Fincke; 9, Pell and Grant; 10, Doyle and Doyle.

Woman's Championship: 1, Miss Hazel Hotchkiss; 2, Miss Louise E. Hammond.

Trap Shooting—Trap shooting had no difficulty in maintaining its position of popularity in the sporting world during the last year, and throughout the high standard set by the season of 1909 was lived up to in 1910. Many notable tournaments were held in the course of the year, the most important being the six held

by the Interstate Trap Shooting Association; The Post-Season Championships, which included both amateur and professional events; the two Tristate Championships, in the first of which Ohio defeated both Kentucky and Missouri, while in the second Pennsylvania won from New Jersey and Maryland, the Cosmopolitan Championship, captured by A. Ivans, of Jersey City, N. J., and the various State Individual Championships. The latter were held in Arkansas, Illinois, Iowa, Idaho, Indiana, Kentucky, Kansas, Maryland, Montana, Nebraska, New Jersey, North Dakota, New York, Ohio, Oklahoma, Pennsylvania, Texas, Vermont, Wisconsin, and West Virginia. In all of these meetings the shooting was uniformly high grade. The most noteworthy performance of the 1910 trap shooting season was that of Jay R. Graham at Chicago, on 1 September, when he established a new amateur world's record by shooting 417 "birds" without a miss. Graham's total score was 586 out of a possible 600. Other feats of remarkable excellence were those of Harry S. Wallis who shot 138 "birds" straight from a 20-yard mark at Betterton, Md., on 29 July, and of W. R. Crosby who, in competition at Nashville, Tenn., on 10 September made 390 out of a possible 400. On 15 July at Winnipeg, in the only trap-shooting contest which partook at all of an international event, America defeated Canada by a score of 212 to 193. On this occasion the individual honors fell to O. C. Bottger, one of the American representatives, of Rag, N. D.

Thoroughbred Racing—Thoroughbred racing was badly handicapped during the year 1910, as it has been for two or three years previous, through legislation directed against public book-making. The racing season of 1910 came to an end 1 Sept., when the New York law making owners and directors of the various associations which control racing criminally responsible for any gambling that occurred on their premises went into effect. While the sport lasted, however, it was fully up to the standard. Two new American records, which practically amounted to world's records, were established, while a number of horses of unquestionable quality did their part toward writing a bright page in turf history. Bubbling Water took up 121 pounds and established a new mark of 1 minute 42 1-5 seconds for 1 mile and 70 yards, while Everett, a three-year-old with 107 pounds in the saddle, supplanted Fitz Herbert's record for 2 miles by covering that distance in 3 minutes 25 3-5 seconds. S. C. Hildreth headed the 1910 list of winning owners, with a total of \$144,025, while R. T. Wilson was second, with \$65,795; James R. Keene third, with \$54,215; August Belmont fourth, with \$49,705; and R. F. Carman fifth with \$40,325. The total amount distributed in stakes and purses for racing in the large meetings which were held in New York State, which there began 15 April and ended 31 August, was \$961,092. This sum appears rather insignificant when compared to the total amount offered in 1909, but this is explained by the fact that retrenchments were necessary in order to meet the new conditions. The meetings on the whole were well conducted, while the one at Saratoga which reflected great credit on R. T. Wilson and his associates, has rarely if ever been surpassed, even in happier times for racing.

SPORTS

The acknowledged champions for the year 1910 may be listed as follows. (1) Two-year-old colts. S. C. Hildreth's Novelty, by Kingston-Curiosity. He won 10 races, including the Saratoga Special, the Hopeful Stakes, the Rensselaer Handicap, and the Futurity, earning for his owner a total of \$72,930. (2) Two-year-old fillies. The Newcastle Stable's Bashti, by Adam-Disadvantage. She won the Criterion, Astoria, Vernal, and Spinaway stakes among others, for a total of \$14,920. Late in the season she was purchased by Harry Payne for \$30,000, to the end that his colors might be represented in the Futurity, and because she will be eligible for the English Oaks next season. (3) Three-year-old colts. S. C. Hildreth's Dalmation, by Ethelbert Ionis. He won seven races, including the Brooklyn Derby, the Coney Island Jockey Club Stakes, the Empire City Handicap, and the historic Travers stakes, earning altogether \$18,715. (4) Three-year-olds and over: R. T. Wilson's Olambola, Ornus—Blue and White. He won five races, including the Suburban, Commonwealth, Brighton, and Saratoga Handicap, for a total of \$24,035. S. C. Hildreth's great horse FitzHerbert was defeated in the Brooklyn Handicap, but went wrong directly after that and did not start again during the season. Other horses of high class and quality were James R. Keene's Sweep, who won \$21,355; R. F. Carman's Semprolus, who won \$11,395; R. T. Wilson's Nausaion, who won \$23,975; August Belmont's Footprint, who won \$13,290; S. C. Hildreth's King James, the Beverwyck Stable's Sir John Johnson, James R. Keene's Maskette, Thomas Monahan's Textile, and Barney Schreiber's Jack Atkin. Before the season came to its close meetings had been held at Belmont Park, Aqueduct, Jamaica, Saratoga, Sheepshead Bay, Empire City, Gravesend, and Brighton Beach. The most prominent and consistently successful jockeys of 1910 season were Shilling, Powers, Dugan, and Butwell. The English Derby, the classic of the English turf, held at Epsom Downe, was won in 1910 by Mr. Fairie's Lemberg in 2 minutes 35 1-5 seconds, a new record for that historic course. This horse was sired by Cyllene, who also sired Minom, the horse of the late King Edward VIII who captured the Derby in 1909.

Trotting.—The speed of trotting stallions has been constantly on the increase ever since horse racing took its place as the "sport of kings." Since Ethan Allen placed the record at 2.25½ in 1858 it has been gradually bettered and shows a decrease of 24¾ seconds in fifty-two years. The most noticeable improvement was between 1874 and 1876, when Smuggler reduced Mambrino Gift's mark 4¾ seconds. Following that there was a lull in the performance until Directum hung up a record of 2.05¾ in 1893. Then came another period showing an absence of sensational trotting before, in 1900, Cresceus set the mark at 2.04. Following are the best stallion records

1858—Ethan Allen, by Vermont Black Hawk, dam untraced	2 25½
1860—George M. Patchen, by C. M. Clay, dam by Top Bellfounder	2 23½
1866—George Wilkes, by Rysdyk's Hambletonian, dam untraced	2 22
1871—Jay Gould, by Rysdyk's Hambletonian, dam by American Star	2 21½
1874—Smuggler, by Blanco, dam untraced	2 20½

1874—Mambrino Gift, by Mambrino Pilot, dam by Pilot, Jr.	2 20
1876—Smuggler	2 19½
1884—Phalaris, by Dictator, dam by Clark Chief	2 13½
1884—Maxie Cobb, by Happy Medium, dam by Black Jack	2 13½
1889—Axtell, by William L., dam by Mambrino Boy	2 12
1890—Nelson, by Young Rolphe, dam by Gideon	2 11½
1890—Nelson	2 11½
1890—Nelson	2 10½
1891—Allerton, by Jay Bird, dam by Mambrino Boy	2 10
1891—Allerton	2 09½
1891—Palo Alto, by Electioneer, dam by Planet	2 08½
1892—Kremlin, by Lord Russell, dam by Woodford Mambrino	2 08½
1892—Kremlin	2 07½
1893—Directum, by Director, dam by Venture	2 07
1893—Directum	2 06½
1893—Directum	2 05½
1900—Cresceus, by Robert McGregor, dam by Mambrino Howard	2 04½
1900—Cresceus	2 04
1901—Cresceus	2 03½
1901—Cresceus	2 02½
1910—The Harvester, by Walnut Hall, dam by Moko	2 01½

Trotting and Pacing.—The 1910 record of the light harness turf was one of particular brilliancy. Even without the wholesale breaking of records which occurred the year would be a memorable one on account of the marvelous performance of Uhlán, the horse who trotted one mile in 1 minute 58¾ seconds. This feat marks Uhlán as the first real two-minute trotter in the history of the turf. Lou Dillon trotted a mile in 1 minute 58½ seconds in 1905, but he required the aid of a wind-shield in order to turn the trick. In fact, no horse has ever approached the time Uhlán made trotting in the open without having some artificial aid. Uhlán is a son of Bingen, himself one of the greatest trotters of his day, and indications are that the sterling little miler has not reached the limit of his speed even in his remarkable 1910 performance. However, although Uhlán's accomplishment overshadows all else, the 1910 season produced several other horses of distinction in the light harness class, in which America has long led the world. Colorado established a new 3-year-old record by trotting a mile in 2 minutes 4 3-5 seconds; Joan, by covering a mile in the same time, set a new mark for 4-year-old trotters; Native Belle eclipsed the best previous time for a 3-year-old filly when she trotted 1 mile in 2 minutes 6½ seconds; while The Harvester proved himself second only to Uhlán by establishing a new stallion 1 mile record of 2 minutes 1 second by setting a new mark of 4 minutes 15¾ seconds for 2 miles.

The pacers, or "side wheelers" as they are called, did not play such an important part in 1910 horse racing as did the trotters, although Minor Heir stands prominently by virtue of establishing a new world's record for 1 mile in a race, pacing that distance in 1 mile 59 seconds. Dan Patch still holds the 1 mile record against time of 1 minute 55 seconds, but Minor Heir's consistently fast work indicates that he will better that figure before long. Aside from the work of Minor Heir nothing remarkable was done in pacing during 1910.

Wrestling.—Despite vigorous efforts to revive it, wrestling utterly failed to gain a hold on the general American sporting public during 1910. Several very important matches were held nevertheless. Frank Gotch, present holder of the world's championship, wrestled twice during the year, meeting Patrick Conolly and

Zbyszko both in two straight falls Zbyszko was the most active wrestler during the year. He defeated Tom Jenkins, Charles Cutler, twice; Raoul de Rouen, four times, James Parr; J. Rodgers Karl Alberg, Ernest Feuby, Yussif Mahout; C. Pons, and Dr. B. F. Roller three times, all in two straight falls. Zbyszko also wrestled once to a draw with Doctor Roller, and in a match at London with Gama, the Indian wrestled to a draw, only to lose the match by forfeit through failure to appear on the date scheduled for its continuance. Except for his defeat at the hands of Gotch, this was the only bout lost by Zbyszko during the year, while he also has a single fall victory over J. Lerm to his credit. Aside from the defeats he suffered from Zbyszko, Doctor Roller enjoyed a highly successful season, winning from Henry Ordemann, John Perelli, "Mysterious Waffles," Humid Kala Pasha, Carl Backer, and Raoul de Rouen twice, all these victories being gained in two straight falls. He lost to both Yussif Mahmoud and Gama in two straight falls. Yussif Mahmoud won from Stanley Fitzsimmons, from Patrick Connolly, and from Raoul de Rouen twice without in any instance being thrown himself, and also gained a decision over "Americans" in an unfinished match which was stopped by the police. Aside from the defeats already mentioned Raoul de Rouen also lost to J. Westergaard, but he did succeed in winning one match during the year, when he triumphed over Charles Olsen. George Bonther, on the occasion he entered competition defeated Sandelli, winning two falls in catch-as-catch-can style and losing one in Græcco-Roman. The middle-weight championship was captured by Harry Gehring, of Cleveland, who won from Chris Jordan in two straight falls, while the middleweight title of New England went to Sam Anderson of Norwood. The National Amateur Wrestling Championships were held at Chicago on 26 February, resulting in victory for the following 105-pound class: George Taylor, of the Newark, N. J., National Twin Verein; 115-pound class: John Hein, of the New York Boys' Club, 125-pound class: Max Hummelhook, of the Detroit Y. M. C. A., 135-pound class: G. S. Kennedy, of the Chicago Lincoln Turners; 145-pound class: Carl Johnson, of the Brooklyn-Swedish American Athletic Club, 158-pound class: Frederick Nerganes, of the New York Athletic Club; and heavy-weight class: Frank Motis, of Chicago. The 1910 Intercollegiate Wrestling Championships were held at Philadelphia on 19 March and resulted in a victory for Cornell, the point score being: Cornell, 11; Princeton, 7; Pennsylvania, 5; and Columbia, 5.

Yachting.—The season 1910 must go on record as one of the most successful in the annals of American yachting, there being more boats built and more races sailed than in any previous year. A feature of the season was the increase in the fleet of one-design boats—small sloops capable of being handled by two persons in a 10 or 15 mile race. There was a substantial increase, too, in the number of powerboats using gasoline for fuel and a greatly reduced number of accidents with craft of this type. Of the seven ocean races held during 1910, three of which were for sailing craft and four for power boats, the 1,200 mile Philadelphia-Havana race in which four boats

competed held the chief interest, being the longest course ever attempted by vessels of small dimensions driven by internal combustion engines. The 50-foot power-boat *Berneyo*, owned by S. W. Granbery, was the winner, covering the distance in 150 hours, 19 minutes—an average of 797 nautical miles an hour for the entire 1,200 miles. The power-boat race to Bermuda of 670 miles was won by Samuel Cochrane's *Eronel II*, and the race from Marblehead to New York by the *Elmo II*, the property of F. D. Gules, Jr. The sailing race to Bermuda was captured by Harold Vanderbilt's schooner *Vagrant*. The two international races of 1910 both resulted in American victories. The most important of these, the sonderklasse contest between Spanish and American boats, held in August off Marblehead, Mass., for the cup presented by President Taft, was won by the American boat *Harpoon*, owned by Charles Francis Adams, 2d. The second prize, a cup presented by Governor Draper, of Massachusetts, also fell to this country through C. H. W. Foster's *Beaver*. In the other international event F. K. Burnham's *Dixie III*, upheld America's supremacy over England in the motor-boat class, winning by a comfortable margin. Early in July Larchmont race week brought together the largest number of yachts of all classes of the season, 112 boats starting in one of the races. In the cruise of the New York Yacht Club, lasting for 10 days in August under the leadership of Commodore A. C. James, Cornelius Vanderbilt's *Aurora*, of the 65-foot class won both the Astor cups for sloops and the King's cup. The same sloop also won the Bennett Cup on 7 July and Autumn Cup on 15 September and altogether out of 35 starts, captured 13 first, 13 second, and 8 third prizes, thus easily ranking as the best in her class. The Astor cup for schooners went to F. F. Brewster's schooner, *Elmira*, the same boat also winning the commodore's, vice commodore's, and rear commodore's cups in the squadron runs from port to port on the New York Yacht Club's cruise, together with the Alumni Association of the United States Navy Challenge Cup, and the first prize in class B in all those races. The new Herreshoff sloop *Shimna*, owned by Morton F. Plant, proved the winner of the first prize in class L in the runs of 4, 5, 6, 7, 8, and 10 August. Starting with the *Avenger* eleven times, she won seven of the races. Other races of special interest in yachting season were the New York Athletic Club's 100-mile race to Block Island, won by R. B. Budd's sloop *Wanderer IV*; the Brooklyn Yacht Club's 300-mile race to Cape May and return, won by Leo S. Herzig's *Gardema*, the Seawanhaka cup race, off Marblehead, Mass., won by E. A. Boardman's sloop *Massachusetts*; and the race for the Massachusetts Bay challenge cup, won by Stuyvesant Wainwright's *Cora Miss*. The race week of the Atlantic Yacht Club also attracted a splendid fleet of yachts of all classes, including the big sloops *Aurora* and *Winsome*, as well as many other notable boats from Long Island Sound.

Spreckels, Rudolph Bernard. American manufacturer: b. San Francisco 5 Jan. 1857; son of Claude and Anna C. Spreckels; educated in the schools of San Francisco and at Hanover, Germany. He held many offices in sugar refining and in steamship companies, and was

SPRINKLER LEAKAGE INSURANCE—STARS

park commissioner in San Francisco in 1900. He took an important part in the prosecution of ex-Mayor Schmitz and Boss Ruef, and in 1910 began perfecting plans for a national organization to fight concentration of wealth.

Sprinkler Leakage Insurance. See INSURANCE, CASUALTY.

Squash Rackets. See SPORTS.

Stammering, Recent Studies of. Recent investigations have done much toward an understanding of this malady, and something toward its cure. It has been estimated that there are upward of three hundred thousand stammerers in the United States alone, but, according to the researches of Dr. G. Hudson-Makuen, at least one-quarter of these cases could cure themselves at once, if they but made the effort. An improper understanding of the malady is the chief reason for the continuance of stammering in such cases. But the remaining three-quarters present a real and an important problem. Of those who can be cured, many continue to stammer simply by reason of the fact that they believe they will, they are under a form of belief; a "fixed idea," which nothing but proper suggestion can remove. Absolute confidence in self is the only means by which stammering due to this cause can be overcome. "The patient must know that he can cure himself, and not only that, but know that he knows he can." Opposing movements in vocalization, and respiration, regulating tongue and lip action, practice in saying difficult words, rhythmic exercises of various kinds, as well as whispering exercises, have all been tried in the past with varying success.

Doctor Hudson-Makuen pointed out that the defect of most stammerers consists, not so much in the peripheral, as in the central mechanism; the brain centers need correcting, and not the organs of speech themselves (Sometimes, of course, the latter are out of order also). The instrument must be put into good working order; and when that has been accomplished, the ego must be educated and trained so that it can use the instruments of speech with confidence and precision. When once that is accomplished, the stammering is cured. It will thus be seen that the cure of stammering is a complicated and a lengthy process; as it means the thorough redemption of the individual, mental and physical.

These conclusions are more or less in accord with those of Dr. E. W. Scripture, of Columbia University. According to the recent investigations of this psychologist, stuttering is largely due to fear (conscious or subconscious), and its cure means the removal of this inhibitory fear, which paralyzes the muscles used in the operation of speech.

According to Doctor Scripture, a distinct type of lisping speech has been discovered in the epileptic—enabling this disease to be distinguished from hysteria without the addition of any other symptom. Stuttering is now believed to be one of the many forms of psychoneurosis, involving an "obsession" with a strong emotion of fear. The result is the innervation of the vocal muscles—and stuttering in consequence.

As a result of these researches, it is believed that a cure can be effected in practically every case under forty years of age. Lispings, again, has been shown to be due to sluggish

mental activity, or "negligent speech." The varied nervous disorders have all been shown to present their typical and characteristic speech defects—so that dementia, epilepsy, general paralysis, etc., can now be distinguished with absolute certainty from one another, by reason of these special peculiarities. A series of tests with mentally defective children is now being undertaken. It is hoped that this method of investigation will shortly prove of great practical benefit and succeed, very largely, in the eradication of these various speech defects.

Stamp Collecting. The awards in connection with the International Philatelic Exhibition at Bern, in Sept. 1910, showed the remarkable manner in which the collecting of postage stamps, not so many years ago a pursuit regarded by most persons as fit only for school boys, has become a world-wide hobby, studied scientifically, and involving the expenditure of great sums of money. The task of passing on the collections occupied the judges the greater part of three days. The seven judges were natives of six different countries. Two Grand Prix Cups were awarded, 95 medals, and 45 diplomas. The English collections carried off many honors. The King of England sent a collection of Nevis stamps, but did not obtain an award. Prince Doris Pamphily of Italy showed a few rare early Italian stamps, and received a silver medal. H. J. Daveen got a gold medal for his extraordinary collection of Mauritius in addition to a gold medal for his Swiss collection. Since this collection was last exhibited the owner has added what are described as two "superb" copies of the "postoffice" and Mauritius stamps, which came from the collection of the late Sir William Avery. These two stamps are worth about \$15,000 the pair. A block of four of the one penny "post paid" stamps in the unused state cost the owner \$5,000 and was regarded as one of the finest things in the exhibition. The gold medals for the best general collection of postage stamps of the world went to Dr. Rudolphe Ferrario of Como, for a collection of over 13,000 varieties. There was only one American exhibitor, C. Lathrop Park, who showed four collections of stamps, of Spain, the Cape of Good Hope, New Zealand, and Brazil. For each collection, Mr. Park gained a silver-gilt medal. A special meeting of the Bernese Philatelic Society held an animated discussion on the subject of international legislation for the suppression of stamp forgeries. The trouble, it was declared, was that while each country's law sufficiently protected stamps issued under the authority of that particular government, they did not put the laws into practice in cases where stamps of other countries were concerned. During the year there was an exhibition of stamps in the Argentine Republic to celebrate its national centenary, and gold medals were awarded to several eminent philatelists. In this exhibition a marked distinction was made between used and unused stamps, as the reproduction of stamps raises the value of those bearing the dates of postal delivery.

Standard Oil. See OIL.

Standard Oil Company. See TRUSTS.

Stars, Temperature of. One of the most remarkable achievements of modern astronomy and astro-physics is that recently obtained by

STARS — STEINMETZ

M Charles Nordmann, who has succeeded in measuring the effective temperature of certain stars. The apparatus is quite complicated, and is thus described by Mr Joseph Barton in the *Scientific American*, 18 June 1910

"The apparatus consists of a lateral attachment to the eyepiece of an equatorial telescope and, like the Zollner photometer, it allows the focal image of the star to be placed in juxtaposition to that of an artificial star. This part of the apparatus contains two Nicol prisms, the third Nicol and quartz plate of Zollner's photometer being suppressed. Furthermore, between the focus and the eye piece, in the common path of the rays of the real and artificial star, is placed a sliding drum, which carries interchangeable cells filled with colored liquids. In this manner a series of mono-chromatic images of the real and artificial stars can be produced. The photographic measurement is made by rendering the images of the two stars equally bright by turning the two Nicol prisms, which are interposed in the path of the rays, from the artificial star, and are provided with graduated circles

"The artificial star, which performs the function of a secondary standard, is obtained by converging upon a circular aperture the light of an Osram metallic filament lamp of four volts and one ampere. This little lamp is operated by storage batteries, and regulated by means of a rheostat, and an accurate voltmeter. There is no difficulty in maintaining the differences of potential between the lamp terminals constant to within 1-100 volt, by adjusting the rheostat, once or twice an hour. This corresponds to an inappreciable variation in the brilliancy of the artificial star. The glass cells are filled with solutions of aniline dyes. Nordmann had no difficulty in obtaining solutions which isolate the desired portions of the spectrum. Hitherto he has employed three cells, containing red, green and blue solutions inclosed between parallel glass walls which have a liquid thickness of 1-5 inch. The green cell transmits the part of the spectrum between wave lengths of 590 and 490 millionths of a millimeter. The red cell transmits the part between this portion and the extreme red, and the blue cell transmits the remaining portion of the spectrum extending to the violet end

"The photometer is standardized by directing it upon the interior of an electric furnace heated to various temperatures between 2550° F. and 6500° F, these temperatures being measured by the Féry pyrometer. The first determinations, made with the small horizontal equatorial of the Observatory in Paris and the photometer described above, showed that this method of monochromatic images gives, in a simple manner, the measurements and ratios of the total luminosity of stars, free from the subjective errors inherent to the older process. It permits, furthermore, the solution of certain problems of physical astronomy, especially the measurement of the temperature of stars. The determination of the temperature is based on the fact that if the spectra of two luminous bodies are of equal intensity in their middle portion, but of very different intensities at their extremities, the body whose spectrum is brightest in the blue region possesses the higher temperature. Hence, when the two spectra are compared with flames of known temperature, the temperature of the stars can easily be

deducted from the optical observations. Nordmann finds for the temperature of the sun the value of 5320° C (9608° F). This is much higher than the temperature of the electric arc (3600° C or 6512° F) and agrees very well with the value obtained for the temperature of the sun, actino-metric or pyrheliometric methods."

The following table, contains some of Nordmann's determinations of the temperature of stars

Name of Star	Temperature	
	Dec C	Deg F
Rho Persei	2,870	5,200
Zeta Cephei	4,260	7,700
Gamma Cygni	5,620	10,150
Chi Herculis	7,350	13,250
Polaris . . . . .	...	...
Alpha Lyrae	12,200	22,000
Beta Persei	13,300	24,000
Gamma Lyrae	14,500	26,100
Epsilon Persei	15,200	27,400
Delta Persei	18,500	33,300
Lambda Tauri	400,000	72,000

State Banks. See BANKING, STATE.

Statistical Association, American. The American Statistical Association held two meetings during the year 1910, one a quarterly meeting and dinner at the Ebbitt House, Washington, D. C., 21 October. At this meeting the following papers were read and discussed: "The Scope and Methods of Presentation of the Results of the Thirteenth Census," by Dr. William F. Willoughby, Assistant Director of the Census; and "A Method of Statistical Analysis," by Mr. Oscar T. Crosby. The annual meeting of the Association was held at Planters' Hotel, St. Louis, 28-30 December. Several sessions were held at this time and, among the principal papers presented, were the presidential addresses of Frederick L. Hoffman on "Fifty Years of Life Insurance Progress," "Primary Elections and their Results in Massachusetts, 1640-1691," by Dr. Edward M. Hartwell. One session was devoted to a symposium on the results of the thirteenth census, setting forth particularly the agricultural statistics obtained. This discussion was taken part in by several experts in the Bureau of the Census and professors from various colleges and universities. The Association has published during the year four numbers of its Quarterly Publications, aggregating something like 400 pages of printed matter. The membership of the Association has been increased from 512 to 500. The next annual meeting of the Association will be held at Washington, D. C., 27-30 Dec. 1911

Steam Boiler Insurance. See INSURANCE, CASUALTY.

Steel. See METALS, and IRON AND STEEL.

Steel, Converted. See CONVERTED STEEL

Steinmetz, Charles Proteus, American electrician b Breslau, Germany, 9 April 1865. He received his education in Breslau and Berlin, and in Switzerland making a special study of mathematics, electrical engineering and chemistry, and came to the United States where he was employed as consulting engineer, by the General Electric Co at Schenectady, N. Y., in 1893. He was chosen to the professorship of electrical engineering at Union University in 1892 and is the author of many volumes on the science of electricity, including 'Theory and Calculation of Alternating Current Phenomena' (1897, 4th ed. 1908) 'Theoretical Elements of

STELLITE—STILLWELL

Electrical Engineering' (3d ed. 1909); 'Theory and Calculation of Transient Electric Phenomena and Oscillations' (1909); 'General Lectures on Electrical Engineering' (3d ed. 1909); 'Radiation, Light and Illumination' (1909), and several papers on mathematical and theoretical experiments in electrical engineering

Stellite. This is a new alloy, which has lately been invented, and which, it is asserted, is possessed of many of the properties of steel. Mr Elwood Haynes, the original discoverer and compounder of the alloy, writes of it in the *Scientific American Supplement*, 19 Nov 1910

"After some experimenting, I was able to produce metal that would forge out perfectly into thin strips, which showed no tendency to check. After cooling, these strips are as hard as mild tempered steel, and could scarcely be scratched by a file. A kitchen knife blade was made from this material, and used for all sorts of purposes, such as are known only to the culinary art. After two years of use, it showed not the faintest sign of tarnishing, and if held in the sun, it produced a reflection which would dazzle the eye

"In color, the metal stands out between silver and steel, and if suitably polished, it shows a high luster. I have thus far made no physical tests of the forged metal, but a cast bar showed an elastic limit of 79,000 pounds, and elongation of 3 per cent, and an ultimate strength of 96,000 pounds to the square inch, cross section. A test was also made of the modulus of elasticity of the material, which was found to be fully equal to that of steel. These tests were made on one of the first bars produced, and I am pretty well satisfied that much higher results could now be obtained"

Notwithstanding the fact that pure cobalt is decidedly magnetic, the 25 per cent alloy shows not the slightest attraction for the magnet. With just what per cent of chromium the magnetism disappears, has not yet been determined

Notwithstanding the great hardness of the alloy, it not only forges readily at a red heat, but can be bent at a right angle cold, either in the form of a cast or forged bar, provided the dimensions do not exceed one-fourth square inch. Its elastic limit is not quite equal to that of tool steel of the same hardness, but it is much tougher. Samples can also be made, showing much greater hardness than those described above, but the breaking strain and the elastic limit will, under these circumstances, closely coincide.

Knife and razor blades can be made from this new alloy, though the inventor does not recommend it as a cutting metal. It is recommended, however, for fruit knives,—as the fruit juices, even if of the acid variety, and allowed to dry on, do not effect the metal in the least, nor do the various antiseptic solutions, etc., in surgical operations, and for that reason it may be very suitable for surgical instruments. Also for light tools, balance beams, weights and measures, and cooking utensils

As the result of a series of tests, it has been found that acids act very slowly on the metal. "a polished piece may be boiled for hours in nitric acid without diminishing its luster in the slightest degree." Salt and saline solutions also fail to have any effect. There are, of

course, several modifications of the alloy, according to the varying percentages of its constituents. This is true of all alloys.

Stelzle, Charles, American sociologist, lecturer, and author. b. 4 June 1869. He was a machinist in the works of R. Hoe & Co., New York, 1885-1893, and a member of the International Association of Machinists. As superintendent of the Presbyterian Department of Church and Labor, which was established in 1903, Mr Stelzle has done a pioneer work in inaugurating new lines of church work. The object of his department is "to interpret the Church to workmen and workmen to the Church," which is accomplished through the investigation of social conditions among the workers, a presentation of the aims of the Church and of Labor, and the inauguration of methods to meet the changing social conditions. His plan for the exchange of fraternal delegates between ministers' associations and central labor bodies has been found to work out admirably, and together these organizations are bringing about many municipal reforms. Mr Stelzle, himself, has for six years attended the annual convention of the American Federation of Labor as a fraternal delegate, first from the Presbyterian Board of Home Missions and later from the Social Service Commission of the Federal Council of the Churches of Christ in America. A correspondence course in Applied Chemistry is offered by the department at a nominal fee, to enable ministers and Christian workers to receive the benefit of the latest and best experiments in church work. There is a special course for the city, and another for the country, village and town; in each of which the student is taught how to make a survey of his own field. In his capacity as public lecturer, Mr Stelzle addresses more workmen in popular mass meetings in the large industrial centres of the United States than does any other man in the world. As a concrete example of what may be done in a densely populated downtown district of the city, the Labor Temple, New York, has been established by the Department under the superintendence of Mr. Stelzle. It is designed to meet all the needs of the people of the community—social, ethical, moral and religious. Twenty-five meetings are held every week. Mr. Stelzle is director of the department of Christian Sociology of the Bible Teachers' Training School, New York. He is also secretary of the Social Service Commission of the Federal Council of the Churches of Christ in America. As a writer he has published the following books: 'Boys of the Street: How to Win Them'; 'Messages to Workmen'; 'Christianity's Storm Centre; A Study of the Modern City'; 'Letters from a Workman'; 'Principles of Successful Church Advertising'; 'Church and Labor.'

Stillwell, Arthur Edward, American financier b. Rochester, N. Y., in 1861. With schooling of only two terms he began to earn his living as a printer at 15, and at 19 he was acting as Southern representative of a Baltimore printing concern. Moving to Chicago he represented stationery houses as salesman; and in 1883 became assistant State agent of the Travelers' Insurance Company in Illinois. He invented a new policy which was the first coupon policy ever issued in the insurance field. It was so successful that in two years 60 per cent of all the business of the Trav-

elers' was through this policy. He invented another policy which was adopted by the Penn Mutual and which was remarkably successful.

In 1888, at the age of 27, he resigned his insurance work, though making \$7,500 a year, and went to Kansas City to engage in the railroad business. Here he built the Belt Line, raising the necessary funds from the insurance people with whom he had been working. Thenceforward he was a builder of railroads in the West and Southwest, a business in which his father before him had engaged in the East. In 1892 he began building the Kansas, Pittsburg and Gulf railroad, which was practically an air line from Kansas City to the Gulf of Mexico—800 miles. He had great difficulty in finding an unimpeded outlet to the water front, but solved the problem, which was partly one of capital and partly of competition, by building a land-locked harbor of Lake Sabane, and then opened a canal for bringing the Gulf to the Lake. The City of Port Arthur, the seaport named after him, is one of the results of his determined energy. The Kansas, Pittsburg and Gulf railroad cost \$23,000,000, and the Kansas City, Mexico and Orient, \$45,000,000, which Mr. Stillwell personally raised without having to apply to Wall Street.

The latter road, which will run almost in an air line from Kansas City to Topolobampo, Mexico, in the Gulf of California, was conceived after he had lost control of the Kansas City Southern to Gates, Harrison and Gould. He obtained for it the greatest concession ever given by Mexico. When completed, it is likely to carry a large part of trans-continental traffic and trans-pacific commerce. Besides being the short through-freight line, it will open up immense stretches of virgin territory in Oklahoma, Western Texas, and Mexico. Its length will be 1,659 miles. When 878 miles were completed, early in 1910, Mr. Stillwell sold in England \$5,000,000 worth of bonds, which enabled him to push the work toward completion. Connecting with the Mexican National Railway at Del Rio, Texas, it will be one of the shortest routes between Kansas City and the City of Mexico.

In 1910, Mr. Stillwell published 'Confidence, or National Suicide,' a sensational description of American finance. He believes that too much legislation and too much speculation have held down the earnings of American railroads and discouraged investment in them, which would have caused greater railroad building activity in the past decade than ever before in the history of the United States "if the railroads had been let alone." The book is a screed against Wall Street and its methods.

Stimson, Henry Lewis, American lawyer: b. New York City 21 Sept 1867. He was educated at Phillips (Andover) Academy (1884), Yale University (1888); and Harvard Law School. Admitted to the bar in 1891, he became a member of the firm of Root & Clarke in 1893, the name being changed in 1897 to Root, Howard, Winthrop & Stimson, and in 1901 to Winthrop & Stimson. Mr. Stimson was appointed by President Roosevelt United States Attorney for the Southern District of New York on 1 Feb. 1906, and his activities in this capacity until April 1909, when he returned to the practice of law, attracted public attention. He forced Edward H. Harriman to testify concerning his railroad operations.

Charles W. Morse, the Ice Trust head, was tried and convicted of the misapplication of funds of the National Bank of North America. The weighing frauds by which the Sugar Trust had defrauded the United States for years were brought to light, and resulted in numerous convictions. The total fines imposed by these railroad and sugar trust prosecutions reached \$100,000. The New York Central Railroad appealed to the United States Supreme Court. But Mr. Stimson argued the case again for the Government, and the railroad failed to secure a reversal. Mr. Stimson advocates the short ballot, and not more than four or five offices voted for on any ballot. He believes the governor should have power to appoint the attorney-general and the other officers of his cabinet; and he believes in political parties as a means to an end rather than the end itself. He was a candidate for governor of New York State in 1910, but was defeated by John A. Dix.

Stocks, Commercial Fraud in. The United States Post Office Department has inaugurated a crusade against the get-rich-quick concerns which have plundered the more gullible of American speculators for many years. Postmaster-General Hitchcock put the total amount of theft at \$100,000,000 in five years and declared his intention of putting an end to the practice. Seventy-eight concerns were involved in this wholesale robbery, all of which were prevented from carrying on their business by arrest during the year 1910. Others were known to be still in existence at the end of this period, but the Postmaster-General says that he intends to continue the work of prosecution until this class of fraudulent stock-selling is entirely prevented, putting an end to a "vast system of fraud, as far-reaching in its ramifications as the postal service itself, which has been developed by unscrupulous men, who, through the grossest forms of misrepresentation, have been stealing from the people millions of dollars annually."

In the beginning the help of the Attorney-General was secured, making it possible to cause simultaneous arrests in various parts of the country at the same hour. In this manner the men in active charge of the fraudulent operations were caught at their desks and arrested before they could escape. The most serious offenders had offices scattered throughout the United States and all those involved were caught before they had an opportunity to hide the evidences of their guilt.

Formerly the procedure in such cases was entirely different. A fraud order was issued against the guilty concern, but this proved ineffectual because the guilty parties escaped and needed only to reorganize under a new name. But under the new practice the arrests coming unexpectedly, the guilty promoters are personally seized and advertised as swindlers by the United States Government.

Among the most important cases where the United States has made arrests in this manner during 1910 are the following:

Burr Brothers, Inc., New York, promoters accused by the Post Office Department of carrying on a gigantic swindling scheme involving stocks valued at \$50,000,000; Continental Wireless Telegraph and Telephone Company, New York, accused of issuing swindling stock to the value of \$6,000,000; El Progreso Banana Company, New York, accused of issuing swindling

STOCKS—STONE

stock at a face value of \$500,000; B H. Scheffels, New York, accused by the Postal authorities of swindling the public to the extent of \$3,000,000 United States Wireless Company, New York, with 30,000 stock; W T. Wintermere, promoter of mining and oil stocks, New York, with stocks of a face value of \$1,500,000. Metropolitan and Suburban Real Estate Company, New York, accused of fraudulent dealings in land, Edward S. Boggs & Co, New York, accused of operating a "bucketshop"; Standard Stock and Grain Company, Jersey City, accused of operating "bucketshops" under the direction of Louis Cella; William B Price, Baltimore, accused of operating a "bucketshop"; Joseph F. Gatins, New York, accused of operating a chain of "bucketshops" in many cities; Consolidated Stock Exchange, Philadelphia, headquarters for a number of concerns accused of dealing in worthless stock and operating "bucketshops"; George K Eastwick and Edwin M. Darnalt, Philadelphia, accused of fraudulent land dealings, Steele-Miller Company, Cornth, Miss., accused of handling worthless cotton bills of lading to the face value of \$2,000,000, United Exchange, Chicago, capitalized at \$20,000,000 and accused of operating in valueless securities; John C Mabray and a large number of confederates, accused of placing bets on horse races and athletic contests which had no existence in fact. Eighty-five were indicted in Council Bluffs and ninety in Omaha. National Assurance Company, Wilmington, Del, accused of handling swindling stocks; Bankers' Bond Company, Pittsburg, accused as a stock and bond swindle under direction of Thomas P. Daniels

Great influence has been brought to bear to protect some of the richer companies, causing Postmaster-General Hitchcock to supervise personally some of the more important raids. Taking active charge of the work on the ground he has in all the more important cases directed the inspectors and engineered the arrests so that they have taken place simultaneously as planned.

Following each exposure, there has been a revelation of stock swindling in which widowed women and other equally helpless individuals figured most prominently. The Postoffice Department has found, on investigating the books of some of these concerns, that the investors in almost every case have been of this nature. The amount of money raised was shown immediately after the arrest of the Burr Brothers, mining stock promoters in New York. After the Postoffice inspectors seized their New York office, \$25,000 in orders were received during the next three hours. Their mail from investors averaged during the first few days after the arrest of the members of the firm over 1,000 letters a day. Checks ranged in size from a few dollars to more than \$10,000. In many cases these were from widows who were investing the life insurance money just received, in the hope of doubling or tripling it.

Before making raids on promoters of valueless mining stocks, the postoffice Department has been compelled to act with extreme care and send experts to the properties being financed in order to secure evidence. In this manner it has been possible to show where the mines or other properties were non-existent or valueless.

Before the series of raids began there was a thorough reorganization of the Postoffice in-

spection service, eliminating all chance of influence being brought to bear. A new chief Postoffice inspector was chosen and there was a general reassignment of postoffice inspectors in the 15 divisions. When the reorganization was effected, plans were laid for making the raids at such times that sufficient evidence could be secured, and the principals themselves seized. Postoffice inspectors were detailed to follow the operations of various concerns for many months before open attacks began, with the result that the arrests when made placed the inspectors in such a position that they were able to take charge of the work in actual progress and secure incriminating evidence against the men they were chiefly after.

Chief Postoffice Inspector Warren W. Dickson, who was responsible for the successful prosecution of "green goods" operators 10 years ago, was placed in charge of the work of driving out of business the get-rich-quick companies doing business chiefly through offices in New York. He estimated that the promoters of fraudulent mining stock ventures collected no less than \$200,000 a day from guileless investors. This figure he named as conservative, giving instances of office buildings to which many mail-sacks containing checks and money orders were sent daily and not a cent was ever spent on the properties which were supposed to be developed. This money was very easily obtained, he said, pointing out that there were in existence duplicate lists of gullible investors containing in the aggregate 250,000 names. The larger firms had lists of all these names, and the entire expense of their undertaking was office rent, salaries, postage, and advertising. Among the newer schemes in operation were the use of the names of prominent men, the fleeing of lodge members by fellow members, the formation of companies which act as "fiscal agents" and receive all but a small amount of the money sent in. Inspector Dickson found that one concern was receiving \$50,000 worth of checks a day to develop properties which remained practically untouched.

Stone, John Stone, American experimental and consulting electrical engineer, inventor, lecturer and author. b. Dover, Goochland County, Virginia, 26 Sept. 1869. His childhood was passed largely in Egypt, and he early displayed a fondness for the study of physics and chemistry. In 1883 he entered Columbia Grammar School in New York City; he then spent two years at the School of Mines of Columbia University, and two years at Johns Hopkins University. His studies took up the line of mathematics, physics and engineering, and his course at Johns Hopkins was practically a post-graduate course. He entered the employ of the American Bell Telephone Company, Boston, in laboratory work in 1890 and he remained with the Company, first as an experimentalist, and afterwards as an expert, up to 1899. He was then consulting electrical engineer on his own account 1899-1908, when he became vice-president and chief engineer of the Stone Telegraph and Telephone Company. On 1 June 1908 he became president of the Company. He was also special lecturer on electrical oscillations at the Massachusetts Institute of Technology for several years. He secured more than one hundred United States patents and a corresponding number in foreign countries, covering various inventions, including a system for centralizing

STONY BROOK ASSOCIATION—STORAGE BATTERY STREET CAR

the energy in telephone systems, in 1893, which came into very general use in the United States and abroad. In 1897 a patent was granted him for the first operative method for increasing the efficiency of telephone lines by the increase of the inductance of the line. His method was, however, superseded by one patented by Prof. M. I. Pupin, of Columbia University, New York. In 1902-03 he took out a group of patents covering a system of selective wireless telegraphy free from interference, and in 1903 patents cover the first application of the principals of electrical resonance to useful arts. He has also been granted patents for a system of wireless telegraphy in which the messages are automatically rendered secret or illegible except at the station at which they are intended to be received, and also for a system by which ships at sea may determine their bearings by wireless telegraph communication with shore stations. He was elected to fellowship in the American Academy of Arts and Sciences; a fellow of the American Association for the Advancement of Sciences; President of the Society of Wireless Telegraph Engineers; member of the American Electrochemical Society; Associate of the American Institute of Electrical Engineers; member of the Society of Arts of the Massachusetts Institute of Technology; Vice-President of the Wireless Telegraph Association of America; is a member of the Mathematical and Physical Club. He is the author of valuable papers read before the engineering societies of the United States, published in the technical press.

Stony Brook Association. An addition of more than usual importance to the rapidly increasing list of summer assembly grounds was made when the Stony Brook Association inaugurated its work on the north shore of Long Island 3 July 1910. What gives this new institution its peculiar significance is the fact that it is to be made the summer headquarters of the American evangelist, Dr. J. Wilbur Chapman. The Rev. John F. Carson, pastor of Central Presbyterian Church, Brooklyn, is president of the association, and the Rev. James M. Farrar, pastor of the "Old First" Reformed Church, Brooklyn, is vice-president. With these and other clergymen are associated prominent workers, teachers, and musicians. Mr. Charles M. Alexander, who accompanies Doctor Chapman on his world-wide evangelistic tours, Mr. Robert Harkness, the pianist, and Mr. E. W. Naftzger, the tenor soloist, are also identified with Stony Brook, as is also Mr. Robert Gayler, a prominent Church organist of Brooklyn. Prof. J. W. Jenks, of Cornell University was present during the sessions of 1910, and conducted a special conference on civic and economic subjects.

The property of the Association consists of about 270 acres and is situated about 60 miles from New York. An auditorium with a seating capacity of 1,500 has been built and a number of cottages and other buildings erected. A feature of the session of 1910 was a "tent colony" where visitors to the assembly were accommodated in comfortable camp fashion.

The formal opening of the Assembly took place on Sunday, July 3, when the auditorium was dedicated. On the following day a Fourth of July celebration occurred, at which addresses were delivered by well-known men. This marked the beginning of the Civic Conference,

under the direction of Professor Jenks. During the sessions of this conference such subjects were discussed as The Increased Cost of Living, Congested Population, The White Slave Traffic, Child Labor, the Conservation of Our National Resources, etc.

11 to 17 July was "Farmers' Week." Practical instruction was given in agricultural methods and free discussions held on the varied interests and problems of the farmer. This conference was under the direction of Prof. Charles A. Tuck, of the New York College of Agriculture at Cornell University. From 24-31 July a conference for men was conducted, and from 31 July to 6 August a conference for young people.

The most important assembly held during the first season was the Bible Conference, from 14 to 28 August, under the leadership of President Carson. Doctor Chapman was present throughout the conference and conducted a "quiet hour" daily, preached on the two Sundays included in the dates of the Conference, and spoke frequently on special themes.

Storage Battery Street Car. After nine years of effort, Thomas A. Edison, in 1910, established the possibility of universal use of storage battery cars by placing one in actual operation. The storage battery is much lighter than the used type and is provided with positive and negative elements that do not deteriorate because an alkali is used instead of an acid for the electrolyte. When the first batteries appeared seven years ago it was found that the graphite became oxidized and interfered with the output. Chemically pure nickel was substituted for the graphite, but other difficulties arose, and it was several years before it was possible to overcome the trouble. A great deal of money was spent, but finally the battery was evolved by Edison and tried on automobiles and power trucks. Having proved successful there, it was then tried on a street car in East Orange, N. J., and found to be feasible. To make the power go as far as possible it was determined to have a light car of special construction, leaving an opportunity to make use of the weight in the placing of batteries. There were installed 210 cells, 200 for power and 10 for lighting. Not having to support a trolley pole the roof of the car was made very light, and the whole superstructure was of the thinnest possible material.

The new type of car showed a radical departure from former car construction and exhibits the influence of the automobile. In place of gearing the motors directly to the wheels as in former cars, the silent chain is used, which has been found by automobile manufacturers to cause a large saving in the transmission of power. A gear reduction of 6 to 1 is permitted by the new arrangement, which allows the use of lighter batteries. The 5-horsepower 110-volt motors of light construction are used, permitting a maximum speed of 15 miles an hour. The total weight of the car is five tons and it will seat 26 passengers. A car with a similar seating capacity ordinarily weighs twice as much. The battery was constructed to move the car 150 miles without stopping, and in ordinary street traffic twice as far.

The car has been placed in service by the Erie railroad between West Orange and Forest Hill, N. J., to take the place of old shuttle cars. It is used on the ordinary railroad tracks

STRAITS SETTLEMENTS—STRAUS

and maintains a speed of an ordinary locomotive, showing a saving in fuel compared to the number of passengers carried. The 28th St line in New York is also equipped with the new cars. It has also been proposed by Edison to place cars in operation over the road between Hoboken and Summit. The Delaware, Lackawanna and Western Railroad also contemplates using similar cars.

Straits Settlements. A British Colony between the Indian and Pacific Oceans, made up of the following islands and territories: Singapore, area 206 square miles, population 223,550; Labuan, 31 square miles, population 8,300; Christmas Island, 55 square miles, 1,200 population; the Cocos or Keeling group (20 islets), population 700; Prince of Wales Island, 107 square miles, population 128,800; Wellesley Province, 288 square miles, population 244,100; Dindings Territory, 260 square miles, population 4,100; and Malacca (the largest of the colonial settlements), 660 square miles, population 95,500. In 1901 there were more than 10,000 Americans and Europeans in the Straits Settlements. About 15,000 square miles of territory were acquired from Siam in 1909, population nearly 500,000; bringing the total area of the settlements up to 16,650 square miles, and the population to over 1,200,000. Singapore town is the seat of Government. George Town is the principal centre of Penang district. Victoria, the capital of Labuan, has 1,500 inhabitants. The administration is conducted under a Governor, supported by an Executive Council, (composed of seven members), and a Legislative Council of 16 members (seven unofficial), with the Governor as President. Seven members of the latter Council are nominated by the Singapore and Penang Chambers of Commerce, and five by the Crown. The Resident Councillors of Penang and Malacca sit in the Executive Council. There is a municipal political organization. The receipts of the Government in 1908 amounted to \$5,101,150, and the expenditure to \$5,595,250. The chief sources of revenue were licenses, \$3,545,000, posts and telegraphs, \$305,000; land revenue, \$235,000; stamps, \$220,000, and office fees, \$190,000. The main items of expenditure were salaries, \$1,685,000; military, \$1,095,000; sundry charges, \$1,090,000; public works, \$785,000; pensions, \$225,000, and debt, \$175,000. The estimated revenue for 1909 was about \$5,237,000. The public debt of the Straits Settlements amounts to about \$25,000,000. The Government Savings Bank had deposits aggregating \$387,000 in 1908. Eleven banking houses do business in the country. The "dollar" is worth about 55 cents. Minor judicial tribunals are marine magistrates' courts, police courts, and district courts. A Supreme Court sits bi-monthly at Penang and Singapore and quarterly at Malacca as a court of assizes, and conducts civil proceedings monthly and quarterly in the first two and last named places, respectively. Convictions in superior courts in 1908 numbered more than 500; in inferior courts, 42,300. Malay teachers are fitted for the work of education in a college in Malacca. In 1908 there were 31 English Government and aided schools, with more than 11,300 pupils enrolled; and 178 vernacular schools, with an enrollment of about 11,950 pupils. The temperature varies little throughout the year, and the vegetation is perennial. Many varieties of agricultural products are cultivated. The cat-

tle-raising industry is important. Tin-mining is a source of profit to the country. The exports for 1908 were about as follows: Tin, to the value of \$41,840,000, spices, \$7,615,000; gums, \$7,315,000, copra, \$5,305,000, gambier, \$2,640,000; rattans, \$2,280,000, hides, \$1,160,000; preserved pineapples, \$1,545,000, and tapioca and sago, \$1,065,000. The leading articles of import and the respective values of same were approximately: Rice, \$21,735,000, cotton goods, \$6,865,000, opium, \$5,340,000, fish, \$4,565,000; coal, \$4,380,000, tobacco, \$3,740,000; sugar, \$2,870,000, machinery, iron ware, etc, \$2,765,000; and coal oil, \$1,820. (Local trade, among the islands, not included in the above statistics.) The imports and exports at Singapore, for 1908, amounted, respectively, to about \$134,460,000, and \$111,740,000; at Penang, \$55,475,000, and \$52,950,000; Malacca, \$2,645,000, and \$2,430,000; and at Labuan, \$655,000, and \$665,000. The value of British trade for 1908 was about \$55,210,000, imports and exports. The four leading ports are Singapore (which, in respect of shipping, is one of the best ports in the world, and a port of call), Penang, Malacca, and Labuan; shipping entered in 1908, 9,250 vessels (besides native junks and other craft), registering more than 10,891,950 tons. There is a railway in Labuan, about 15 miles in length; a line runs out of the capital to the Johore Straits; Malacca and Tampin (in the Negri Sembilan) are in railway communication; and another line from Krian territory passes through Wellesley Province, and connects with ferries for Penang. Telegraph lines establish communication between Labuan and Singapore, and Labuan and other points beyond the Settlements.

Strange, Robert, second P. E. bishop of East Carolina and 220th in succession in the American episcopate. b. Wilmington, N. C., 6 Dec 1857. He was graduated from the University of North Carolina, A. B. 1879 and from the Berkeley Divinity School, Conn., in 1883; was ordered deacon in 1884, advanced to the priesthood the following year, and served as missionary to the colored people in Southern Virginia 1883-95. He was rector of the Church of the Good Shepherd, Raleigh, N. C., 1885-87; of St James, Richmond, Va., 1900-04. On 26 May 1904 he was elected coadjutor to the Rt Rev. Alfred Augustine Watson, D. D., bishop of the diocese of East Carolina, and was consecrated 1 Nov. 1904 by Bishops Capers, Randolph, and Cheshire. The honorary degree of D. D. was conferred on him by the University of North Carolina in 1895. He was a deputy from East Carolina to the General Convention of the P. E. Church in 1898 and from Virginia in 1904. On the death of Bishop Watson, 21 April 1905, he succeeded as second missionary bishop of the diocese of East Carolina.

Straus, Nathan, American merchant and philanthropist. b. 31 Jan. 1848, brother of Isidor and Oscar Straus (qv). The family came to America in 1854, settled in Georgia, and after the war went to New York where he was graduated from Packard's Business College. He then entered his father's firm as importer of pottery and glassware, also became partner in the R. H. Macy & Co's department store in New York, and member of the firm of Abraham & Straus in Brooklyn. He is well-known for many philanthropies, especially that

STRAUS—STUDENT MOVEMENT

of furnishing sterilized milk to the poor, by a system which has been adopted in Chicago, Philadelphia, and other cities, and which statistics show has saved many thousands of infant lives. He also originated and maintained depots for the distribution of coal to the poor of New York, and in the panic of 1893-94 established and kept up lodging houses for the poor and homeless.

Straus, Oscar Solomon, American merchant and diplomat b Otterberg, Bavaria, 23 Dec 1850, brother of Isidor and Nathan Straus. He came to the United States in 1854 and lived in Georgia until 1865, when he came to New York, entered Columbia College from which he was graduated in 1871 and from its law school in 1873, after which he practiced law until 1881, when he entered the firm of L. Straus & Sons, importers of pottery and glassware, continuing his connection therewith until 1906. He has the unique distinction of having served as the American diplomatic representative at Constantinople under three administrations. He was first appointed in 1887, as Envoy Extraordinary and Minister Plenipotentiary to Turkey, serving two years; and in 1898 was appointed a second time to the same post, again serving only two years. In 1902 on the death of ex-President Harrison, he was chosen a member of the Permanent Court of International Arbitration at the Hague. From 1906 to 1909 he was Secretary of Commerce and Labor in the Cabinet of President Roosevelt, and in May 1909 was appointed by President Taft as Ambassador Extraordinary and Minister Plenipotentiary to Turkey. This office he resigned in 1910. He is President of the American Jewish Historical Society, and has published 'The Origin of the Republican Form of Government of the United States'; 'Roger Williams, the Pioneer of Religious Liberty'; 'The Development of Religious Liberty in the United States'; 'Reform in the Consular Service'; 'United States Doctrine of Citizenship'; and 'Our Diplomacy with Reference to Our Foreign Service'.

Strauss, Richard, German composer and conductor b Munich, 11 June 1864. He studied music at Munich, was made court musical director there in 1886, and became court Hofcapellmeister successively at Weimar (1889), Munich (1895), and at the Opera House, Berlin, since 1898. He visited the United States in 1904-05, where he appeared as conductor of performances of his works. His compositions include songs, symphonic poems and operas, in which he is regarded as representing the ultra-modern school. His music has been the centre of much discussion; but the general consensus of opinion is, and certainly the popular verdict, that much of his music touches a very high plane of beauty, melody and effectiveness. His most sensational successes in opera have been 'Salome' (1905), and 'Elektra' (1909). Some of his other works are: 'Aus Italien' (1886); 'Don Juan' (1889); 'Tod und Verklärung' (1890); 'Macbeth' (1891); 'Till Eulenspiegel' (1894); 'Guntram' (1895); also 'Sprach Zarathustra' (1896); 'Don Quixote' (1898); 'Ein Heldenleben' (1899); and 'Feuersnot' (1901).

Street Cleaning. See DUST

Strikes. See LABOR STRIKES.

Student Movement, World's. The growth of the World's Student movement, which reached the greatest point of efficiency it has yet attained during 1910, is one of the most striking events in educational history, mirroring as it does the trend of the coming generation toward things religious. Having their beginning a little more than 20 years ago with but one paid secretary, the Christian associations of the colleges to-day employ 150 men who devote their entire time to promoting the moral and religious interests of undergraduates. The Student Movement is now recognized as the only intercollegiate organization bound to the fostering of Christian ideals of life and service. In some universities—notably the State colleges of Illinois and Wisconsin—the association has large buildings suitably equipped to serve as the college social centre, while in others, for example Yale, Princeton, Harvard and the University of Pennsylvania, it conducts extensive social settlements, besides doing much in the line of constructive philanthropy in the cause of better citizenship.

In view of the rapidly expanding work, the leaders of the movement in the summer of 1910 established a summer school for secretaries, chartering the equipment of Lake Forest College, near Chicago, from 7 August to 28 August. During that period 120 student secretaries from all parts of America gathered in the Lake Forest dormitories, together with representatives from the student movements of Italy, South America, and China. The universities of Illinois, Iowa, Kansas, Minnesota, Michigan, Wisconsin, Cornell, Harvard, Princeton, Pennsylvania, McGill, Toronto, and Virginia, all sent student delegates, while such colleges as Oberlin, Williams, Brown, and Pomona also had representation.

The Executive committee in charge of this summer school, consisting of E. C. Carter, of Harvard, W. D. Weatherford, of Vanderbilt, and O. A. Jacob, of the University of Illinois, engaged some of the foremost university professors of the country to deliver courses of lectures. Under the able leadership of the latter, a serious course of study was adhered to throughout the three weeks of the convention, the chief aim of which was to discover the principles involved in imparting ethical and religious impulses to the educated class of men—particularly young men—and to ascertain the best possible method of applying these principles so as to draw all men within the scope of the association's work.

Great emphasis was laid on the necessity and system of recruiting men for both volunteer and professional social work. Prof Graham Taylor, of the University of Chicago, was one of the leaders in this aspect of the work, devoting his attention to it during all the days of the meeting.

Dr John R. Mott, general secretary of the World Student Federation, delivered the closing series of lectures at the Lake Forest convention. He took for his subject the inspirational theme of "The Essentials of Successful Leadership." The secretaries of the various branches of the association also received careful and extensive drill in the routine work of their office. The whole meeting was so successful that it will hereafter be made a permanent feature of the association's work, always empha-

SUBMARINE SOUND SIGNALS—SUBWAYS AND TUNNELS

sizing the necessity of combining fine graduate training with high qualities of leadership in the large work of enlisting American students in performing their full service to both church and State.

Submarine Sound Signals. It has long been felt that aerial sound signals were very inadequate, and open to many practical objections, such as the difficulty of locating the sound, the difficulty, in fogs, storms, etc., of hearing them at all, and so forth. For these reasons, it was felt that submarine sound signals would be in many ways preferable, as water is known to be a superior medium for the transmission of sounds. Nearly a hundred years ago, (in 1826) Colladon constructed a large bell, with which he experimented on Lake Geneva. The bell was suspended five feet under the water, and struck with a clapper, arranged as a lever. He found that he could hear the sounds, with distinctness, at a distance of eight miles; and stated his belief that "by employing a bigger bell and improving and enlarging the hearing apparatus, easy communication could be effected under the water of a lake, or of the sea, to 15 or 20 leagues."

In 1903, light vessels off Boston, Sandy Hook, Fire Island, and Nantucket were furnished with submarine fog-bells. In these cases, the bell was suspended some 30 feet below the surface, and the clapper was operated by means of compressed air. These sounds could be heard for some miles by vessels equipped with microphones suitable for receiving such sound signals. Even when the vessel was not thus equipped, it was found that, by placing the ear against the side of the vessel, in the hold, the sounds could be heard; but the direction of the sound could not be ascertained by this means. The trial of these signals proved so successful that nearly 50 vessels are equipped with submarine sound signals of the kind at the present time. Bells have also been attached to buoys, which sound beneath the water.

These signals will ultimately prove of immense importance as a means of signalling between submarine boats at sea. In May 1907, two submarine boats, the *Octopus* and the *Starling* were thus furnished, and several messages exchanged. On ocean-going vessels the method has proved of great value also, and it is asserted that, only lately, the *Lucania* made all three light vessels by submarine sound signals; the captain of the *Kaiser Wilhelm der Grosse* also was enabled to reach port in a dense fog, by means of these signals, when 12 miles out at sea and when the fog-horn was quite inaudible. It is as yet uncertain how far these signals can be heard; but they have been distinctly heard at a distance of 27 miles, off Kiel, Germany. This may have been possible from the peculiar nature of the sea-bottom, however; and an extensive series of experiments will have to be conducted in waters of various depths, before any definite conclusions can be arrived at. The value of the method has, however, been established beyond doubt.

Subsidies, Ship. See SHIP SUBSIDIES.

Subways and Tunnels. The close of the year 1910 witnessed more important subway and tunnel projects under way and contemplated than at any previous time in the history of the world. Undertakings which in previous

years would have attracted unusual attention went almost unnoticed, although the cost ran high into the millions. Probably the most conspicuous and in many ways the most remarkable undertaking which was completed during the year was that of the Pennsylvania Railroad, which spent more than \$100,000,000 to secure a terminal in the heart of New York city. Instead of having its tracks end at Jersey City, by constructing subaqueous tubes under the Hudson River it was enabled to run its trains directly into the new station at 32d street and 7th avenue; and, extending the tracks under the city directly across Manhattan Island, four subaqueous tubes were laid under the East River to handle the traffic of Long Island, the Long Island Railroad having become a portion of the Pennsylvania System.

Subway construction in New York City has grown to such an extent that the newer enterprises have been forced to seek lower levels in order to reach important points. This situation is illustrated at 42d street and Park avenue, at the new station of the New York Central Railroad, where there will be five superimposed tracks to handle the traffic. In addition, the trains coming into the railroad station will be in two tiers and be run below the surface, giving the appearance more of a subway than a railroad terminal.

Of the five levels of tracks, the street is at present occupied by the tracks of the surface railways and above them is a spur of the Third Avenue Railway. On the level immediately below are the tracks of the Interborough Rapid Transit Company's subway. Below this are to be constructed the two other subway systems which give this remarkable result. The one just under the Interborough's tracks will be the track of the Hudson and Manhattan Railway (McAdoo tubes), which will connect this point by subway extensions with the Jersey shore. In Nov 1910 the extensions were completed to 33d street and 6th avenue, and the work progressed steadily up 6th avenue to Bryant Park where the tubes will turn and extend to Park avenue. To make access to the street as easy as possible, the station will be close under the Interborough's tracks. Under this station will be that of New York and Long Island Railway (Steinway tube), extending from Long Island below the East River and 42d street to the Grand Central Station.

To provide quick communication between the Grand Central Station and these various subway systems, cross passageways at each level will lead into the Grand Central Station, making the most complicated system in the world. Elevators of unprecedented size will be necessary to handle the traffic between levels. There will be tremendous concourses underground and, although this will be the busiest transportation centre in the world, handling directly or by means of the McAdoo tubes, the traffic of every railroad leading out of New York, with the exception of the Central Railway of New Jersey, it will not be seen from the street and traffic will remain unobstructed. The highest architectural and engineering skill has been necessary to provide ready facilities in every direction. The whole complicated system has been so arranged that passengers will find it difficult to go astray and hundreds of

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thousands of people will be handled there every day without jostling or inconvenience

Subway extensions have been the most important of municipal work in New York City, although a few other American cities have been forced to similar attempts to prevent the congestion of traffic. The Steinway tube remained unused for several years on account of the difficulties arising over financial matters, and the same difficulty delayed construction on important outlets such as the Fourth Avenue Subway in Brooklyn and the extensions of all existing lines. Methods in subway construction have changed radically under the need of increased speed. Formerly contractors used large numbers of teams and men, pulling the wagons to the street by the aid of inclines and cables on pulleys, but in modern developments derricks do practically all the work. Gigantic steam-driven steel shovels, automatically pulling up, filling and disposing of dirt cars have practically done away with dirt wagons. In the construction of the Fourth Avenue Subway, Brooklyn, one of the contracting companies which was digging through the heart of the city, built a private railroad through the quieter streets to a dock where the dirt was disposed of, without interfering with the city traffic. Instead of the whole city being torn up, as happened in the building of the Interborough tunnels on Manhattan Island, street traffic is practically undisturbed. This is also true of the McAdoo tubes, which are being pushed under some of the busiest centres in New York without appreciable interference with the street level traffic.

When the Pennsylvania tunnels were driven across New York, they did not interfere with traffic in any way, the dirt and rock removed being hauled underground to the two rivers and dumped on scows. At only one point was the work visible from the surface, where an air hole was sunk from an open lot. The 500 buildings which formerly stood on the four blocks now occupied by the new Pennsylvania Station in New York were removed by tunneling methods. Instead of attacking the individual houses, great shafts and tunnels were burrowed through whole blocks, wagons waited on the end nearest the Hudson River, each receiving a load at one motion of a steam shovel above.

Subway and subaqueous work has been reduced within the past few years to simple standards. A class of blasters has developed capable of removing solid rock from under sky-scrapers, without the shock being felt in the building overhead. There is the most important work in subway construction. In subaqueous construction where the work is of large proportions and it is possible to drive straight tubes through mud and sand, the American shield and compressed air construction is almost universally favored. The tubes in this case progress by rings, which are manufactured in segments and fitted in rings to the tube already constructed. At the "face" of the work is the shield which is forced forward by compressed air, giving the workmen an opportunity to fit the segments together. Each ring is a unit in itself and the shield progresses from ring to ring.

The first tube driven in Europe by the American method was in constructing the ex-

tension to the Paris Metropolitan, which involved tunnels under the Seine. Formerly caisson-work had been favored, but in this instance, although the work involved problems not previously met, the American method was used with success. The most novel method of subway construction, however, is shown in the latest extension, extending from the Porte de Clignancourt to the Porte d'Orleans. On account of the curved track it was necessary to sink steel caissons under the Seine and drive the tubes from the central points. Other caissons were sunk at the Place St. Michel, Place de St. Andre, and the Flower Market, and the whole was connected by tubes.

The most difficult piece of work was the sections between the elliptical caisson of the Place St. Michel and Caisson No. 5 under the Seine, which passed under the street, under the Orleans Railway, the quay and a portion of the river bed. To carry out this tremendous and at the same time delicate task, the freezing method was used. Complications resulted from its use, as the tunnel lay on a four-per cent grade instead of level. It was necessary to connect the two caissons by a tube of ice, 213 feet long, and form beneath the river a solid block of ice which would prevent the entrance of water into the tube during construction. Freezing tubes were placed so close together that cylinders of ice which formed about them met and made a solid mass. To accommodate them, 24 holes were bored parallel to the axis of the tunnel by boring machines.

These boring machines were constructed for the purpose. Each had a hollow shaft, keyed to a hydraulic piston, by which it could be advanced or retracted. The inner shaft was rotated by an electric motor rigidly connected with the outer shaft. Forcing water into the cylinder containing the piston and driving forward the boring rod, the refuse was carried out by a stream of water which passed out between the boring rod and the tube. The boring tool had a cutting edge of diamonds, acting like the teeth of a saw. Following it, section by section, freezing tubes were inserted. The variety of material passed through made the process extremely difficult.

The Andes, which divide South America into two distinctly separate districts, was pierced by a tunnel which was successfully opened early in 1910, connecting the Atlantic city of Buenos Ayres with the Pacific city of Valparaiso. Before it was constructed, a journey of 4,000 miles was necessary, unless the perilous pass was open, although the distance between the cities is only 900 miles. Now it is crossed in 36 hours. Labor was the chief difficulty, the Italians imported for the purpose failing to become acclimatized; and the native peons finally did the work. The tunnel is 11,000 feet above sea level and encountered unusual difficulties, such as blizzards throughout the year, earthquakes, and sudden bursting out of springs. The work was finally completed in Nov. 1910.

The tunnel in the new Arica (Chile) La Paz (Bolivia) Railway will be lower than the last mentioned, but the tunnel to connect La Paz with Sicuani on the Southern Railway of Peru is to be at an elevation of 12,000 feet.

In addition to the Simplon tunnel, which marked a new era in European railroading by connecting France and Italy at an elevation of

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only 2,310 feet, a new tunnel bringing a portion of Italy into more direct communication with Northern Europe has been built under the Balmhorn. Passing under the Kander River, and then under the mountain from Kandersteg, it emerges in the Lotschenthal, and, after a short tunnel, into the Rhone valley.

In Central Europe several important tunnels have been built and projected. The Jamam tunnel on the Ligne Montreaux-Oberland-Bernois is the most important, but the new tunnel between Lichtensteg and Utnach is scarcely less so, as it is over five miles in length. A tunnel is projected through the Col de la Faucille, between Lons le Saulnier and Geneva.

Tunnels are less expensive to build now than formerly, when each linear yard ran as high as \$1,130. The Simplon tunnel cost \$720 a yard. The Tauern tunnel from Gastein in Salzburg to Spittal on the Drave, is $5\frac{1}{4}$ miles long and cost £1,250,000 sterling to construct. The whole road, 30 miles in length, cost £12,500,000 sterling.

In modern railroad construction tunnels are avoided as much as possible, except in the special instances where a great mountain must be pierced. The American railroads are now built with an eye to reducing grades, however, and, on this account the number of tunnels, while decreased in some instances, remain about the same. A notable instance of avoiding the necessity of a tunnel is the Bergen cut on the Erie Railway, immediately outside of Jersey City. Formerly the trains all passed through what was one of the most important tunnels in its day, having been constructed half a century ago, but the ventilation was so bad that the increased traffic prevented the smoke from leaving the tunnel between the passage of trains. As this is a centre for suburban trains, it became necessary to avoid the difficulty, and a plan was adopted by which Bergen hill was traversed by a cut almost 100 feet deep, with four short tunnels, the widest in the world, at the street crossings. The whole of it was blasted out without disturbing the old tunnel, which lay close at one side and a few feet below the new track level. To prevent wrecks caused by falling stone from the roof of the old tunnel, the tracks had to be constantly patrolled and the trains were sent through in solid lines during the intervals between blasting. The new cut accommodates three tracks, two of which are used for the heavy inward traffic in the morning, and vice versa.

Sudan. Anglo-Egyptian territory in north-eastern Africa, estimated to be 950,000 square miles in extent, and to have a population of 2,360,000. The country is divided into 13 provinces. Khartoum is the capital town, with 18,200 inhabitants. Khartoum North has a population of 35,300, and Omdurman (the old Dervish capital) a population of 42,800. The administration is carried on in accordance with an agreement signed at Cairo in 1899 between Great Britain and Egypt, which provided, among other things, that the flags of the two countries should fly together. The Governor-General conducts the foreign relations of the district of Darfur, a tributary State comprehended in the Cairo treaty, but its hereditary Sultan holds full sway in the interior. Directly in charge of the 13 provinces of the country are British army officers or civil officials, they

are responsible to British inspectors, and the inspectors in turn to district officials, usually belonging to the Egyptian army. In 1910 a Council of Government was formed, as an advisory power in executive and legislative capacities. The Government revenue for 1910 was estimated at about \$5,500,000, and the expenditure at \$7,000,000. There are Mohammedan courts for the natives, presided over by Kadis. The Indian codes of justice are practically, and generally, in use. There are 6 English judges. Appeal is had from the provincial tribunals, in charge of the governor and 2 magistrates, to a Commissioner at the capital. Higher education is dispensed in the Gordon College, where about 130 teachers are given a five-year course, and 50 students instructed in engineering and surveying. Six primary schools, attended by 900 boys, teach English, Arabic, mathematics, and other subjects. More than 2,000 pupils are taught in other elementary schools, called "kuttabs," throughout the country. Girls' establishments are preparing, and the work of public instruction in general is extending. Land under cultivation, about 1,106,000 acres. Dura, millet, sesame, pulse, and many other cereals are grown; but the soil is very rich, in parts, and favorable to the production of cotton (the growth of which is extending), and other profitable articles of commerce. The forest contains such valuable woods as ebony, bamboo, acacia, and various fibres and tanning material. Rubber is quite abundant in the forests, also, and splendid gum. Sundry minerals are found and developed, there are gold-mines at Omhabard. Imports into Sudan comprise clothing, coal, machinery, railway material, etc. The exports consist chiefly of gum, ivory, ostrich feathers, cereals, cotton, and dates. In 1908 imports were valued at about \$9,460,000, and exports at approximately \$2,575,000. Boats and steamers ply the waters of the Blue and White Niles. Railways connect the capital with Wadi Halfa, and with Wad Medani, on the Blue Nile. There are other lines. Cairo is now less than 100 hours' journey from Khartoum, via boat and rail. There were 4,965 miles of telegraph lines in 1909, and 57 telegraph and postoffices in Anglo-Egyptian Sudan.

Sugar, Beet. The beet sugar industry has grown to be one of the most important in the United States. Twenty years ago the beet sugar output of this country was about 5,000,000 pounds a year. The latest Department of Agriculture report, covering the year 1909, shows an output of 1,024,000,000. This means an annual increase of 1,019,000,000 within the comparatively brief space of 20 years—a truly wonderful growth. No manufacturing industry so intimately associated with and dependent upon agriculture has ever shown such remarkable development or such far-reaching influence in the stimulation and upbuilding of the whole system of agriculture. In the year 1901 there were 36 factories in this country operating in the conversion into sugar of the beet product of 175,083 planted acres. In 1909 65 factories handled the total yield of 420,262 acres. California had 10 factories in operation, Colorado 16, Idaho 3, Michigan 16, Utah 5, Wisconsin 4, while 11 different States, including New York and Ohio, supplied the remainder with one each. The total sugar consumption of the country in 1909 was 3,648,597 short tons. In 1895 about

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90 per cent of this country's supply was imported. The increase in the cane as well as the beet output of the United States proper, and the acquisition of Hawaii, Porto Rico, and the Philippines since that date, have now reduced the percentage about 30 per cent, so that to-day approximately half our supply is home product. Since the same year, 1895, the national requirement has increased nearly 75 per cent in total quantity, while the per capita requirement has increased from 62 to 82 pounds. It is quite impossible to say at present just what may be safely regarded as a reasonable limit of individual requirement, but it would seem that the present rate of consumption is not far from that limit, and that, therefore, the future increase in total consumption will depend more upon increase in population than it has heretofore.

An interesting battle for commercial supremacy has been going on between beet and cane sugar for the last half century. Although just at present the cane forces of the world seem to be in the ascendancy, the end of the contest is by no means at hand. The earliest dependable figures report the beet supply as 27.2 per cent of the world's total production. That was in 1865. From that time forward the sugar beet gained consistently until it reached its maximum of 64.7 per cent in 1900. The subsequent years show a gradual decline down to 47.5 per cent in 1909. Since 1865 the world supply of sugar has increased eight times over, the 4,400,000,000 pounds of that year having swollen to a demand of 32,500,000,000 pounds in 1909. In 1865 the United States consumed 14.3 per cent of the world's grand total. In 1909, however, this country required about 23 per cent, or nearly one-quarter of the whole supply.

The average yield in the United States at the present time is 10 tons of beets to the acre; while in Germany the average yield is slightly in excess of 13 tons. Experts connected with the Department of Agriculture, however, who have given exhaustive study to the beet sugar situation, particularly from the agricultural standpoint, have shown that it is possible to attain a maximum yield in this country as high as 43 tons to the acre. Of course, a yield of this proportion would require ideal conditions; but the Department of Agriculture is now busy circulating literature which gives ample instructions to the ordinary farmer as to how he may obtain these ideal conditions, so that the 33 tons difference between the actual and the ideal yield really represents nothing more than the farmer's leeway for improvement. The Department of Agriculture, however, is taking a very active interest in this industry, and it seems probable that it will receive considerable stimulus as a result. While the price of nearly all other food substances has increased recently, the price of sugar shows fluctuation due only to temporary conditions of supply. This has been continuously true ever since 1897, at least. As prices are based on world supply, and that supply is now in the vicinity of 15,000,000 tons a year, the influence of the American output of 512,000 tons of beet sugar is inconsiderable on world prices. However, being a highly protected industry, the beet product does have a material influence on the price of sugar in the American market. Although

accurate statistics have not as yet been compiled (December) the indications are that Michigan will surpass all other States for the year 1910 in the size of its beet sugar yield. This would seem to indicate that the efforts of the Department of Agriculture to develop this industry are already making themselves felt there, for, although Michigan has always been ranked as a good beet sugar State, during 1907, 1908, and 1909 Colorado and California have ranked first and second respectively in the production of this product.

Botanically all kinds of sugar beets are of the same species as the common garden beet (*Beta vulgaris*). The differences between varieties have arisen from selection and breeding. Among the more frequently occurring varieties grown in Europe are the Improved Kleinwanzlebeuer, the Kleinwanzlebeuer, and the Vilmorin. The two latter are the most widely known in this country. The actual manufacture of beet sugar is entirely separate from the processes of agriculture, and is one which the farmer can never hope to make his own. In it large capital, skilled artisans, and elaborate machinery for the refining processes are absolutely indispensable. Even with these the extraction of the juice can at best remove only 60 to 70 per cent of the sugar which the beet contains. However, after the juice has been extracted from sugar beets, the pulp can be dried and, either with or without the addition of beet molasses, be sold as a good fodder for farm animals. The sugar beet molasses can also be utilized as a feeding stuff, being mixed with other kinds of fodder which absorb it to a greater or less extent and make it convenient to handle. The best beets for the sugar beet industry are those weighing from one to two pounds. On such crops the farmer usually realizes from \$8 to \$15 an acre.

Sugar, Maple. The demand for maple sugar and syrup for special purposes has been steadily increasing of late in the United States. At first solely an article of food, maple sugar has to-day been almost displaced for this purpose by the cheaper and unflavored cane product. Its peculiar flavor, however, assures its popularity, so that the supply cannot possibly keep pace with the demand; and therefore for 25 years production may be said to have made practically no progress. The explanation of this lies in the fact that at least seven-eighths of the product on the market to-day is a spurious article, which is either only in part maple sugar, or manufactured entirely from foreign materials. There has, however, been a certain amount of trade in pure maple sugar. In the effort to make such a market more widespread, several maple-sugar makers' associations have come into existence and they are now doing much to stimulate improved methods, as well as build up a legitimate trade, so that the future of this industry has now much better prospect.

The total production of maple sugar and syrup in this country reached its height in 1860. Since that time it has been steadily decreasing. In the Southern Appalachians and in Kentucky the decrease, which there is accounted for by the cheapening of cane sugar in the mountain districts, seems permanent. In Indiana, Michigan and Illinois the decrease undoubtedly comes from the cutting down of the maple trees which

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have been very heavily lumbered in the last 10 years. In Western Maryland, however, and the adjacent part of West Virginia, the production of maple sugar has recently been on the increase. For climatic reasons, though, this industry will always necessarily centre in the North. Experiments have shown, however, that most of Pennsylvania and West Virginia, Western Maryland, all of Indiana, and parts of Kentucky, Eastern Tennessee, and Western North Carolina are also adapted to this industry. The Department of Agriculture is at present interesting itself in the matter, and it may be that, with the aid of the sugar makers' associations, the industry will have a speedy revival. In order to accomplish this, however, heroic measures will have to be followed.

Sugar Trust. See TRUSTS.

Suicides. An analysis of the figures, given by Frederick L. Hoffman in his annual tabulation of the suicide record of American cities, leaves no question of doubt, in the judgment of the tabulator, that suicides are on the increase, the record for 1908 proving that during that year the rate was higher than during any previous year for which at least approximately accurate data are available. Against the rate of 18.8 to the 100,000 population in 1907, the rate for 1908 was 21.8, or higher by over one point than the exceptionally high rate for 1904 of 20.7. The increase in the rate for 1908 was three to the 100,000 of population over the rate for 1907, and the actual increase in the number of suicides during the year was 601, or 18.5 per cent, while the corresponding increase in the population during the same period was only 2.3 per cent.

The figures show 2,853 deaths by suicide in 1908 in 65 cities from which returns were received. "In 54 of the cities the rate for 1908," says Mr. Hoffman, "showed an increase in the suicide rate over the previous year, against 48 such cities in 1907, in only 11 cities during 1908 was there a decrease. In other words, the increase in the rate was practically general, although not uniform, throughout the country. The increase was greatest in Salt Lake City, but the highest rate (66.2) occurred in Oakland, Cal., the same as in 1907. The average rate for the 10-year period (1898-1907) was highest for San Francisco (50.6), followed by Oakland (33.6), Hoboken (29.1), St. Louis (28.2), and Denver (24.7). The table is self-explanatory, and requires no extended analysis. A summary of the returns for each year since 1894, together with the aggregate estimated population of the cities under consideration, is set forth in the table for the 15-year period ending with 1908. The returns have also been grouped in five-year periods, to emphasize more clearly the increase in the rate, in conformity to the law of large numbers, and to eliminate minor fluctuations during individual years.

	Population	Suicides	Rate per 100,000 of Population
1894	12,192,328	1,951	16.0
1895	12,623,983	1,999	15.8
1896	12,977,870	2,155	16.6
1897	13,343,473	2,392	17.9
1898	13,764,406	2,420	17.6
1899	14,111,764	2,346	16.6
1900	14,555,669	2,374	16.3
1901	14,968,694	2,524	16.9
1902	15,302,873	2,747	18.0
1903	15,697,237	3,034	19.3

	Population	Suicides	Rate per 100,000 of Population
1904	16,091,796	3,329	20.7
1905	16,488,700	3,032	18.4
1906	16,881,607	2,955	17.5
1907	17,276,669	3,252	18.8
1908	17,675,922	3,853	21.8
1894-98	64,902,060	10,917	16.8
1899-1903 . . .	74,535,837	13,025	17.5
1904-08	84,474,594	16,421	19.5

"When the 65 cities are arranged according to size, it is brought out that the degree of suicidal frequency is lowest in the small cities and highest in the large cities. During the 10-year period ending with 1907, the suicide rate was 12.4 to the 100,000 of population in cities with less than 50,000 to 250,000 inhabitants, and 19.4 in cities with more than 250,000 population. During 1908 the relative position was practically the same, or 13.1 for the first group, 19.8 for the second, and 22.7 for the third. Comparing 1908 with the average for the preceding decade, the suicide rate increased 0.7 per 100,000 in the small cities, 5.6 in the middle group, and 3.3 in the groups of large cities."

An analysis of individual cases of suicide seems to sustain the conclusion that the increase in suicidal frequency affects particularly the well-to-do, prosperous and better educated elements of the population rather than the unfortunate, the ignorant and the poor. Such study of individual cases also reveals the fact of a close connection between suicide and crime in all its phases, particularly, however, crimes of a more serious character committed by men in high positions of responsibility, where the only alternative is the termination of life by self-murder. Finally, there is positive evidence of mental and physical deterioration, found in part at least among those who have come from the country to live in the cities and to whom the intensity of city life, its opportunities for excitement and temptation, prove disastrous, causing mental unbalance, nervous diseases, and material, moral and spiritual discontent.

Sulp-Hemoglobineuria. See MEDICINE.

Sun. See ASTRONOMY.

Sun, Recent Investigations of. Investigations of the sun are constantly being made, and theories regarding it are frequently being advanced. It is only within the past few years that the newer conception has become current that much of the sun's activity is due to a kind of radio-activity, *i. e.*, the presence of radium. Before then, the older notion, that the sun was simply a burning mass of fiery gas, was uniformly maintained. The introduction of radio-activity into the problem, however, has had the effect, at once, of necessitating a recasting of the scientific views as to the age of the sun, the length of time it will continue to warm us, and of explaining many of its phenomena. Compare the views advanced in 'The Sun' by C. A. Young (1889), and 'Worlds in the Making,' by Svante Arrhenius (1908). It is now thought that the sun will continue to give us heat for many thousands of millions and perhaps billions of years to come.

Late investigations as to the atmosphere of the sun have proved of great interest and importance. As far back as 1868, it had been ascertained that the red prominences seen in the total eclipse were composed, in great part, of incandescent hydrogen, and, after the eclipse,

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Lockyer and Janssen, by the aid of the spectroscope and the red ray of hydrogen, were able to examine the prominences and the cromosphere which had previously been seen only during the eclipse. The interior parts were, however, not touched by their methods.

About 1892, however, a method was evolved by means of which a llvapors, light and heavy, were revealed, as well as the layers in the whole of the hemisphere that was turned toward the earth. By means of an instrument known as "spectroheliograph," still further advances were made possible. In a great lecture delivered before the Royal Institution, London, M. H. Deslandres, director of the Meudon Observatory, summarized the most recent investigations on the atmosphere of the sun, including his own observations which had extended over nearly 20 years. M. Deslandres described a special spectroheliograph which he had constructed after he became director of the Meudon Observatory in 1907, and which was designated to isolate clearly the upper layers of the atmosphere. In 1908 he was able to detect the upper layer of calcium vapor, thus showing that the vapor existed in three distinct layers, or four if the sun's face were counted; and in the following year, study of the hydrogen lines led to the conclusion that the vapors of hydrogen also were distributed in three distinct layers.

A phenomenon peculiar to the upper layers was afforded by long dark lines which were prolonged by similar lines less dark and less distinct, called by him "alignments." By means of a special instrument, designed to reveal the radical improvements of the solar vapors, he found that such movements were, in general, greater over the filaments than over neighboring points, and he came to the conclusion that there the vapor was ascending with a speed often nearly equal to the equatorial speed of rotation (2 km per second). Similar measures made in the centre of the sun over the faculae and floccula showed the opposite result,—the vapor having a descending movement. This observation explained the special structure of the atmospheric layers, which appeared to be divided into convection currents in juxtaposition, just as was a liquid heated from below. Finally, the lecturer pointed out that the filaments, which appeared in all latitudes, were generally grouped at the poles, in a more or less circular curve. This curve was commonly to be seen at one pole, but sometimes it was distinct at both.

One other point should be mentioned. For many years the causes of the magnetic storms could not be determined; but late speculations have, to a certain extent, rendered these manifestations explicable. A recent exhaustive discussion of the available data led Lauder to the conclusion that the source of the periodic storms is in the sun; that the magnetic disturbances are confined to restricted areas of the sun, and that their influences are propagated out of the sun in cones which rotate with the sun; and when these cones of magnetic disturbances strike the earth, magnetic storms are induced; and these magnetic storms have intimate, though unknown, relations with sunspots. Says Moulton in his 'Introduction to Astronomy' (p. 438):

"The most important contribution to this

investigation is that there is much observational evidence to show that the sun is not to be regarded as surrounded by a polarized magnetic sphere, but that there are definite and intense stream-lines of magnetic influence, probably connected with the coronal rays, reaching out principally from the spot zones in directions which are not necessarily radical. It is a little early to formulate a precise theory as to whether these streams are electrified particles driven off by magnetic forces and light pressure, whether they involve the minute corpuscles of which atoms are composed, or whether they are phenomena of matter and energy of a character and in a state not yet recognized by science."

In a recent important address, Prof. E. Gehrcke stated that the sun might be regarded as an intensely hot body surrounded by an atmosphere of very small density. It closely resembles, in fact, a body which is incandescent in a vacuum. Cathode rays are emitted by the sun for every body, incandescent and in a vacuum, sends forth the electrons, or negatively charged particles, of which these cathode rays consist. In total eclipses of the sun, peculiar radiating lines of light are sometimes observed, the so-called coronal rays or streamers, which often extend outward to great distances, equal to many times the sun's diameter. The similarity of these coronal rays to streams of negative electrons immediately suggests itself, and if such coronal streamers had not been actually observed, we would be led by the foregoing considerations to seek them. It is only the intense brightness of the disk of the sun that makes the corona ordinarily visible. In solar eclipses, the photosphere is hidden by the moon, and the corona appears as a glowing coronet surrounding the dark disk of our satellite.

As a further consequence of this theory of the sun's constitution, it appears that the sun must acquire a positive electric charge through the continual loss of negative electricity. The view that the sun is positively charged appears to have been first expressed by Arrhenius. Hence it may be expected that in certain conditions, positive rays may also be emitted by the sun. The radiations are thus thought to be positive rays, resembling the canal and anode rays. In numerous ways, these radiations have been identified. On this theory, a sun spot represents a local cathode in the sun, and consequently must emit cathode rays.

It will thus be seen that the sun's luminous phenomena are very similar to terrestrial thunderstorms. The difference is due chiefly to the difference in the atmospheric pressure—high here and low on the surface of the sun. Similar rays may be observed in some of the fixed stars, and even upon the earth, in the highest strata of the atmosphere. Thus these rays, which appear at first to be the result merely of laboratory experiments, are shown to be constantly produced by nature, in all directions, without human agency.

Sunday School Conference, World's. The sixth World's Sunday School Conference assembled in Washington on 19 May 1910, and continued in session six days. There were 2,780 registered delegates and 1,200 enrolled visitors.

Rev. F. B. Meyer, of London, president of the International Sunday School Association,

SUNDAY SCHOOL CONFERENCE—SUNDAY SCHOOLS

presided over the Conference. At the first evening session, President Taft delivered the formal opening address. Mr Meyer, in introducing the President made the impressive statement that it had been his invariable custom, when a pastor in London, to include in his public service prayer for the President of the United States, declaring that he had done this every Sunday for 20 years. President Taft, in his address, pointed out the insufficiency of secular education at its best, the peril of such education without religious training, and the necessity of the Sunday school for the doing of what would otherwise go undone. Mrs. Taft was presented to the Conference. Hon. John Wanamaker, former Postmaster-General of the United States, made an address at one of the sessions; and Mrs. James S. Sherman, wife of the Vice-President of the United States, presided at one of the simultaneous meetings of the women of the Conference. In honor of the Conference the House of Representatives passed the following resolution:

"Whereas, there will convene in this city, Thursday May nineteenth, Nineteen hundred and ten, the World's Sunday School Convention, composed of representatives of all religious denominations, and whereas, there will be represented at this meeting practically all the civilized nations of the earth, and whereas, the people of the United States have always stood abreast of the foremost advance of the Christian religion; and whereas, the House of Representatives appreciates the honor conferred upon this nation in the selection of its capitol as the meeting place of this Convention, and whereas, a parade of all the members and delegates to said convention, together with all other persons desiring to participate therein, will pass in review before the east front of the nation's capitol at five o'clock post meridian on Friday, the twentieth day of May, Nineteen hundred and ten. Therefore, Be It Resolved, that as a mark of respect to the delegates assembled, as well as to the cause which they represent, and for the further purpose of permitting members of the House who may desire to do so to participate in said parade, the House do adjourn not later than four o'clock post meridian on Friday, May twentieth, Nineteen hundred and ten."

The death of Edward VII, King of England, occurring just previous to the meeting, resolutions of sympathy, addressed to Queen Alexandra, were adopted after being read by Bishop Hartzell, who had been present at the King's coronation. It was reported to the Conference that the total membership of the Sunday schools of the world is 28,000,000. There were Sunday schools in 126 of the 192 countries in the world, and an increase of 3,000,000 was reported in membership since the last World's Conference, held at Rome, in 1907.

Dr. George W. Bailey, of Philadelphia, giving the report of the World's Executive Committee, told of the tour of Japan made under the Committee's direction by Mr. Frank L. Brown, of Brooklyn, N. Y., superintendent of what is said to be the largest Sunday school in the world. Mr. Brown found a promising national organization in Japan. Doctor Bailey stated that in Korea the Sunday schools were multiplying so fast that the missionaries cannot keep pace with the demands. The schools there are so monopolized by the adults that the children can receive but scant attention.

The British section of the executive committee was reported to have arranged to support a Sunday school secretary for five years in China, where it has been conducting a vigorous campaign. Its president, Rev. F. B. Meyer, spent six months in a Sunday school tour of South Africa, after which he visited Turkey, the Malay Peninsula, China, and Siberia. Its American

section, cooperating with the International Association, is supplying Sunday school secretaries in Mexico, the West Indies, and Japan, besides rendering assistance in North Africa, Bulgaria, Turkey, Italy, and Algeria. Immediately preceding the Conference a tour in the interest of Sunday school work had been made through 18 of the large cities of the United States by President Meyer, Mr. Marion Lawrence and Mr. E. O. Excell, accompanied also for a part of the tour by Bishop Hartzell.

Mr. Lawrence, who is one of the general secretaries of the association, reported that no officer or worker connected with the association has received a salary or any remuneration.

Throughout the Conference the work of the Sunday school in relation to the missionary enterprise was emphasized. The business of the Sunday school was declared to be to assist in the world-wide campaign for spreading the Christian religion. On Friday the street parade took place, composed chiefly of the members of men's Bible classes in the Sunday schools of the United States. It is said that 5,000 men took part in this demonstration. Sunday, 22 May, was designated World's Sunday School Day. The schools in all countries of the world had been asked to hold services on that date in cooperation with the Conference at Washington. A uniform responsive exercise had been prepared and circulated throughout the world some months before. This had been translated and printed in more than one hundred languages and was used orally in another hundred. Mr. Charles Gallaudet Trumbull, editor of the *Sunday School Times*, reporting the Conference for his paper, wrote of this international service: "It was beyond question the most momentous fact and factor in Sunday school work the world has ever known." On Monday evening the evangelists, Chapman and Alexander, conducted a gospel service.

One of the important acts of the Conference was the raising of more than \$75,000 to be expended in international work. The Twentieth Century Crusade, a plan for extending the membership and efficiency of the Sunday schools of the world, was also launched.

The following officers of the association were elected president, Dr. George W. Bailey, Pennsylvania, chairman of executive committee, E. K. Warren, Michigan; joint general secretaries, Marion Lawrence, for the United States, and Rev. Carey Bonner, for England; joint general treasurers, Fred A. Wells, for the United States, Sir George White, for England; joint statistical secretaries, Hugh Cork, for the United States, George Shipway, for England.

The next World's Conference is to be held in 1913 at Geneva, Switzerland.

Sunday Schools. The First Day Society, founded in Philadelphia in 1791, and still active, led to the formation of the Philadelphia Sunday and Adult School Union in 1817. With other similar societies it was changed to the American Sunday School Union, 1824. Its objects are: (1) to establish and maintain Sunday schools; (2) to publish and circulate moral and religious publications. It is a voluntary union of Christians of different denominations, to teach the truths of Christianity as they are taught in the Bible. Its great field is in the rural districts. The Philadelphia Union began with one juvenile book in 1817, and one mis-

SUNDAY SCHOOLS — SUNSHINE SOCIETY

sionary in 1821. The American Sunday School Union now issues 1,000 works and nine periodicals. In 86 years it has circulated \$12,000,000 to \$15,000,000 worth of Bibles, Testaments, and religious works. In 10 years it founded 24,992 Sunday schools with 964,412 members; resulting in 98,659 conversions and the building of 1,062 churches. In 86 years the Union has founded 121,038 Sunday schools with 5,423,222 members. It employs Sunday school missionaries, who organize an average of four new Sunday schools a day for the last 80 years. Its benevolent work costs \$225,000 yearly. The following statistics of Sunday schools of all countries were reported at the Twelfth International Sunday School Convention, held at Louisville, Ky., June 1908:

Europe.—United Kingdom: Sunday schools, 46,399; teachers, 684,342; scholars, 7,450,374. Austria-Hungary: Sunday schools, 238; teachers, 643; scholars, 10,572. Belgium: Sunday schools, 132; teachers, 346; scholars, 6,600. Bulgaria: Sunday schools, 29; teachers, 72; scholars, 1,496. Denmark: Sunday schools, 1,000; teachers, 5,000; scholars, 80,000. Finland: Sunday schools, 7,611; teachers, 12,928; scholars, 165,140. France: Sunday schools, 1,200; teachers, 7,000; scholars, 67,000. Germany: Sunday schools, 8,073; teachers, 28,356; scholars, 855,114. Greece: Sunday schools, 6; teachers, 8; scholars, 200. Holland: Sunday schools, 2,020; teachers, 5,092; scholars, 206,000. Italy: Sunday schools, 350; teachers, 1,500; scholars, 16,000. Norway: Sunday schools, 325; teachers, 2,000; scholars, 26,000. Portugal: Sunday schools, 18; teachers, 72; scholars, 1,717. Russia: Sunday schools, 350; teachers, 1,100; scholars, 12,000. Spain: Sunday schools, 100; teachers, 200; scholars, 6,500. Sweden: Sunday schools, 4,155; teachers, 18,025; scholars, 320,000. Switzerland: Sunday schools, 1,762; teachers, 7,490; scholars, 122,567. Turkey in Europe: Sunday schools, 28; teachers, 42; scholars, 1,129.

Asia.—Persia: Sunday schools, 167; teachers, 440; scholars, 4,876. Siam: Sunday schools, 16; teachers, 64; scholars, 800. China: Sunday schools, 105; teachers, 1,052; scholars, 5,264. Japan: Sunday schools, 1,074; teachers, 7,505; scholars, 44,035. Turkey in Asia: Sunday schools, 516; teachers, 4,250; scholars, 25,838.

Africa.—Sunday schools, 4,246; teachers, 8,355; scholars, 161,394.

North America.—United States: Sunday schools, 140,519; teachers, 1,451,855; scholars, 11,329,253. Canada: Sunday schools, 10,750; teachers, 85,632; scholars, 684,235. Newfoundland and Labrador: Sunday schools, 353; teachers, 2,374; scholars, 22,766. West Indies: Sunday schools, 2,306; teachers, 10,769; scholars, 111,335. Central America: Sunday schools, 231; teachers, 577; scholars, 5,741. Mexico: Sunday schools, 426; teachers, 1,600; scholars, 15,128.

South America.—Sunday schools, 350; teachers, 3,000; scholars, 150,000.

Oceania.—Australasia: Sunday schools, 7,458; teachers, 54,670; scholars, 595,031. Fiji Islands: Sunday schools, 1,474; teachers, 3,700; scholars, 42,909. Hawaiian Islands: Sunday schools, 230; teachers, 1,413; scholars, 15,840. Other islands: Sunday schools, 210; teachers, 800; scholars, 10,000. For the world the total

is therefore: Sunday schools, 244,528; teachers, 2,411,373; scholars, 22,572,858.

Sunshine Society, International. Starting as an idea in the mind of a newspaper woman in New York, the work of the International Society has spread over the United States and into other countries, and has now a membership of 300,000. Mrs Cynthia Westover Alden is the president-general of the organization, and the originator of its work. While on the staff of the New York *Recorder* some years ago, Mrs Alden protested to her fellow workers that she would have gotten more pleasure from the cards they had sent her as Christmas gifts if they had refrained from adding their signatures, as she desired to give them away. Her friends were amazed at this statement that she would part with the gifts they had made, but she confessed that this was her preference. She explained the pleasure afforded some of her acquaintances by passing on other cards she had received, and the members of the *Recorder* staff were so much impressed by her narration that they sent Mrs Alden a second set of cards unsigned, which she immediately sent out again. The thanks received at the office in response to these simple gifts was so striking that an item was made of it in the paper. Further correspondence resulted, friendly greetings were exchanged, a column under the caption "Chat" was set apart in the *Recorder*, and finally the contributors to this column were organized into a club taking for its motto the words "Good Cheer," and calling itself the Shut-in Society.

Finding that a society had previously been formed bearing this name, the change was made, 15 Jan. 1896, to the Sunshine Society. The organization was incorporated under the laws of the State of New York in Feb 1900. Its object is "To incite its members to a performance of kind and helpful deeds, and thus to bring the sunshine of happiness into the greatest possible number of hearts and homes." Branches of the society now exist in every State and in some foreign countries. When a State has 10 branches it becomes entitled to a State president, and State presidents work in cooperation with Mrs Alden, the president-general, at New York. The society publishes a monthly magazine, *The International Sunshine Bulletin*, and its work is reported in more than 300 other papers and magazines.

Besides inciting and directing the interchange of kindness, remembrances and gifts on the part of its members, caring especially for the cheer of sick and aged people, and providing fresh air outings for poor children in the summer months, the society supports two homes for blind babies (one at Summit, N. J., the other at Dyker Heights, Brooklyn, N. Y.), at which blind children are given the best possible care by physicians, nurses and teachers.

There is a unique absence of anything like "charity" in the work of the Sunshine Society. It is essentially an affair of friendship. The officers receive no pay for their services, and those to whom the gifts and letters are sent realize that they are not sent because the recipients are poor, as in many cases they are not, but because someone has been thinking of them. Goods of every description are received at the main office and sent out again with their message of sunshine.

SUN SPOTS—SUPERSTITION

Sun Spots. Apparent proof that sun spots are in reality huge cyclones on the face of the sun has been obtained by Prof. George E. Hale at Mt. Wilson Observatory, California. In addition he has also shown the existence of powerful magnetic fields on the sun's surface, which was long suspected to be a fact on account of the apparent connection between sun-spots and terrestrial magnetism. The importance of this discovery, astronomers agree, has not yet been appreciated, and further developments are anticipated which will have the effect of changing many existing astronomical theories.

The spectro-heliograph is responsible for the new discovery. When it was first used for solar research, the first monochromatic images of the sun were obtained. These pictures compared with drawings or photographs made by ordinary processes, show the sun entirely different. The chromosphere is strewn with incandescent clouds, presumably produced by the vapors of calcium floating in the solar atmosphere at a considerable height, above the spots and faculae. The outlines of these clouds, which have been named the calcium "floculi," markedly resemble the cumulative clouds of our own atmosphere, changing their form rapidly in somewhat the same manner.

The clouds, or "floculi," of hydrogen were photographed for the first time in 1905, but have been the means since of acquiring this new knowledge regarding the sun. Certain aspects of these spectro-heliographic photographs resemble the distribution of iron filings in a magnetic field, suggesting some power force. What this is, was not discovered, however, until 1908, when another hydrogen line being applied to the photography of the floculi by Professor Hale, what appeared to be a cyclonic structure of the spots was made apparent. Photographs taken in May and June of that year showed a large dark hydrogen flocculus approaching a sun-spot with a velocity of 220 miles a second, which ended by being swallowed up in the center.

With this newly discovered phenomenon before him, Professor Hale was reminded of the fact that the whirling motion of electrified bodies produced a magnetic field whose lines of force are parallel to its axis, and ended by concluding that the solar cyclones also give rise to magnetic fields.

To prove this hypothesis, Professor Hale made use of the discovery of Professor Zeeman that the two yellow lines of sodium in a flame burning between the poles of a large electro-magnet each double in the direction of the lines of force, resulting in the law that the distance between the two components is proportional to the intensity of the magnetic field and the square of the wave-length. The light of these two components is polarized, but in opposite directions. Professor Hale's problem then was to see whether the lines he had discovered polarized according to Zeeman's discovery. They did, and Professor Hale was able to say in his latest report that electric and magnetic phenomena play an important part in the sun. Without attempting to carry the matter further than his proofs make positive he says that the magnetic fields can be explained, in our present state of knowledge, only

by a very rapid whirling motion of the electrified corpuscles, indicating that the "sun spots" are really electric storms.

W. J. Humphreys, following a long series of observations at Mount Weather Observatory, Bluemont, Virginia, finds that an increase in sun spots seems to be accompanied by a decrease in terrestrial temperatures, fully twenty-fold that which can be accounted for by decrease in radiation from the sun spots alone. He believes that sun spot maxima, whatever the value at such times of the solar constant, lead to a decrease in the ultra-violent radiation that reaches the earth, and a corresponding decrease in the production by this method of the ozone in the upper atmosphere. The increase in the auroral discharges that accompany sun discharges, he also believes tends to decrease the amount of ozone, especially in the higher altitudes. Consequently, the amount of ozone being decreased, the absorptive quality of the atmosphere is reduced and the heat with it.

He presents the results of his observations merely as a suggestion, and mentions further that, in addition to a careful determination of the solar constant and terrestrial temperature during spot cycles, it would be well to measure at the same time the accompanying changes in the ultra-violet portion of the radiation, and also to follow the temperature and the height of the isothermal layer and note the amount of ozone in the upper air. The information he calls for would be difficult but not impossible to secure.

Superstition. Although superstitions of various kinds have ruled men's minds for countless centuries, and still affect the vast majority of the inhabitants of the globe, no systematic and scientific investigation of these superstitions has been undertaken until recently, when Dr F. B. Dresslar, of the University of Alabama, undertook an extensive inquiry into the forms of belief from the point of view of the modern psychologist. The results of his investigations have been startling. One is usually inclined to believe that superstition holds sway in uneducated minds only, and that the majority,—if not all,—of sensible and educated people have long since ceased to believe in them. This, however, has not been borne out by facts. Professor Dresslar; in an address at a recent meeting of the American Medico-Psychological Association, in Washington, said that 45 per cent of 875 intelligent students preparing to be teachers believe in some 3,000 superstitions,—or at least in one or more of them. In his lecture, "Suggestions on the Psychology of Superstition," he said:

"I have gathered directly from the minds of 875 different students, whose average age is about 19 years, nearly 10,000 specimens of common superstitions. . . . It is fair to say that the evidence of superstition I have collected, cannot be attributed to personal ignorance or to lack of opportunity to come into touch with the methods and products of scientific investigation. Of these 10,000 specimens, I have tabulated and studied 7,776." The following table gives an idea of the type of superstition still, apparently, believed in, and the method of studying the returns of the inquiry:

SURGERY

	No belief	Partial Belief	Full Belief
If you pick your teeth with a splinter taken from a tree that has been struck with lightning, you will never have the tooth-ache	0	0	1
If you cut your hair in the new moon, it will grow better, etc	7	9	14
If you see the new moon over your left shoulder for the first time, you will have bad luck	29	24	3
If you see a star falling, it is a sign some one is dying	7	7	1
If a bird flies in at your window, there will be a death in the family	11	11	5
It is very bad luck to have peacock feathers in the house	6	1	6
If a dog howls, it is a sign of death in the family	17	14	9
If you break a looking glass you will have bad luck for seven years	48	49	16
If you drop the dishrag, you will have company	77	39	22
If you will carry a potato in your pocket, it will cure rheumatism	1	1	1
A potato carried in your pocket will keep away rheumatism	2	0	2
If you carry a rabbit's hind foot in your pocket, you will never have rheumatism	1	0	0
A horse chestnut carried in your pocket will cure rheumatism	1	1	0
If on retiring at night you insert the toe of one shoe in the mouth of the other, and then place them under your bed, it will cure rheumatism	0	1	0
If you will put a spider in a nutshell and wear it around your neck, it will cure a fever	5	0	0

Of the 7,176 confessions, 3,225 expressed belief in the particular superstition under discussion. Professor Dresslar gave one specimen of this belief. "Take this specimen, which is very commonly known: If you permit a baby less than a year old to look into a mirror it will die before it is a year old. Ten out of 11 people who gave me this superstition expressed an abiding belief in the truth of it. Furthermore, these confessions were so expressed that they left no doubt that seeing its own image would be the cause of the death of the baby."

As to the causation or prevention of disease by the wearing of amulets or some similar means, 107 out of 151 believed that disease could be in some way cured in this manner; 19 that it could be so caused, and 25 that it could be prevented by some such means.

These statistics are of great interest in showing us that superstition is still rife, even among the educated in our own day. These superstitious beliefs are an outgrowth of the naive, animistic view of the universe, and modern civilization and culture seem to have done but little to eradicate these primitive beliefs from many minds.

Surgery. The recent advances in the science of surgery have been rapid and great, and it will not be possible to do much more than refer to the more important of them. Chief among them, perhaps, is the work of Doctor Carrel, of the Rockefeller Institute for Medical Research, whose work has attracted the attention of surgeons all the world over, and has opened up a field which had before lain in the realm of vague possibilities. The transplanting of organs, the removal of organs, and replacing them again after a definite time-interval has elapsed; the maintaining of an organ in a state of life outside of the body for a great length of time,—these are some of the modern wonders of surgery in the performance of which Doctor Carrel has figured most prominently. A

brief description of some of these operations will be of interest.

A dog, the ascending aorta of which had been incised and sutured, died two and a half months after the operation. It was found, however, that the wound had healed perfectly and the scar was small. On three other dogs the descending aorta had been severed transversely and united again by continuous through-and-through sutures.

One of these dogs was chloroformed two and a half months after the operation and was in perfect condition. The other two dogs are still living and have suffered no apparent ill effects.

In another novel experiment, a piece of jugular vein, which had been preserved in "cold storage," was used to replace a bit of the upper part of the descending aorta of the dog. The operation lasted twenty-three minutes, and during this time the blood reached the lower part of the aorta through a paraffined tube. The dog remained in good health for twelve days after the operation. His death was due to a slip in the technique of preserving the piece of jugular vein in cold storage.

In another experiment, a segment of jugular vein about three centimeters in length was transplanted on the descending aorta of a small dog. The animal remained in excellent health, and there was no marked modification of the femoral pulse.

By these experiments it has been shown that cardiotomy (cutting into the heart), followed by suture with large silk thread, does not present any danger of an unusual kind. The opening of the heart, the introduction of the finger into the cavity, even the removal of the heart from the body, does not interfere, under the treatment, with the health of the animal.

Doctor Carrel has tried to develop an operation which could be used in certain cases of mitral insufficiency. This is when the mitral valve between the left auricle and left ventricle does not properly close the aperture. The operation consists in producing a slight constriction of the upper part of the left ventricle. It can be obtained by a partial cuneiform resection of the wall of the ventricle, just below the coronary artery. A dog who underwent this operation was in good health some weeks later.

These experiments are among the first to formulate a complete plastic surgery of the heart and aorta. It is possible that many diseases may soon be cured by surgical means, when certain minor difficulties have been overcome.

Doctor Carrel pumps air into the lungs of animals upon the hearts of which he is experimenting, by passing a tube down the windpipe. The animal is well anesthetized, and the tube is pushed down to the branching of the bronchi. By an ingenious arrangement, this tube is connected with a T-shaped tube, and then indirectly with a bellows and a bottle containing ether. Air can be pumped in at will, and further administration of ether be regulated. In this way, the operations can be performed without any pain to the animal operated upon.

A recent new discovery by Dr. Victor D. Lespinasse, of the Northwestern University Medical School, has been deemed of considerable importance, and it is believed that it will

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prove of great value in certain cases where blood vessels have been severed during an operation. Magnesium rings are employed for uniting the arteries, in the manner indicated by him. In order to illustrate the method, several dogs were produced, each of which had been subject to some special operation. In one, the liver had been removed and reunited, in others, the legs had been removed, and successfully united to other dogs. The secret consisted in the fact that the arteries had been joined together successfully, and in a manner never before accomplished. Hitherto, stitches had always been employed for operations of this character, and Doctor Lespinasse calls attention to the fact that this often results in the formation of blood clots, the constriction of the arteries, or the enlargement and breaking of them. Rings of magnesium do away with this, and offset the danger. After the complete union of the severed ends of the artery has been effected, the magnesium is gradually absorbed away and the vessel resumes its normal condition.

Important improvements have been made during the past few years in methods of determining the contents of the human stomach, and the digestive tube as a whole. Not only are the X-Ray machines found of inestimable value, but ingenious lighting devices are now employed, by means of which the stomach may be illuminated and studied from without, without pain or discomfort to the patient. The contents of the stomach and of the intestines may now be studied in considerable detail, and lately Prof. Max Einhorn, professor of medicine in the New York Post Graduate School, has devised an instrument which enables the physician to examine the contents of the duodenum, which is a very important step forward, inasmuch as many important digestive changes take place in this portion of the bowel. The apparatus used is called the "digestive juice aspirator." The instrument is introduced into the duodenum by way of the esophagus and stomach, and, it is said, without material discomfort to the patient.

A long flexible tube is provided, which terminates in a small, metallic perforated capsule. This capsule is swallowed, and passes through the stomach, and into the duodenum, in the ordinary course of digestion. This done, the outer end of the tube, which still projects from the patient's mouth, is attached to the small hand-suction pump, and when this is operated, the contents of the duodenum are drawn out, and placed in a vial for examination. The tube and its appendages are then withdrawn.

The importance of this method of diagnosis will be apparent when it is stated that the chyme in the duodenum has never before been obtainable in any direct manner, although many of the most important steps in digestion take place in that part of the digestive tube. It is apparent that medicine also may, by this means, be introduced directly into the duodenum, by way of the stomach.

Two important additions have recently been made to our knowledge of remedial operations, and the possibilities of surgery as a cure for certain afflictions and ailments. Of these, one of the most interesting is the stimulation of osseous growth artificially by injecting forma-

lin. This is a solution of the gas formaldehyde, used in a 2-per cent solution. This injection stimulates the secretion of lime in the bones, and thus binds them together. It is hoped that this method will prove of value in mending compound fractures, and in lengthening abnormally short bones, or cases of arrested growth of bone. It is hoped that the treatment may even extend to cases of tuberculosis of the bone.

Recent experiments have also been conducted in the welding together of the ends of a severed artery by means of rings of metal magnesium. The vessels are clamped at either side of the cut, and the ends sewed into holes in the magnesium rings. The tissue is secured firmly, and the two flat rings are fitted against each other and bound together by passing silk thread between the holes in the rims. When once the rings are thus fitted together, the clamps are removed, and the blood is allowed again to flow along its accustomed channel. The metal of the rings is acted upon by the fluids of the body—at first slowly, more forcibly later on. Within eighty or a hundred days, they are completely absorbed by the system, and the wound is completely healed. It is hoped that important results will follow this line of treatment, which adds another to the long line of triumphs which surgical art has achieved within the past few years.

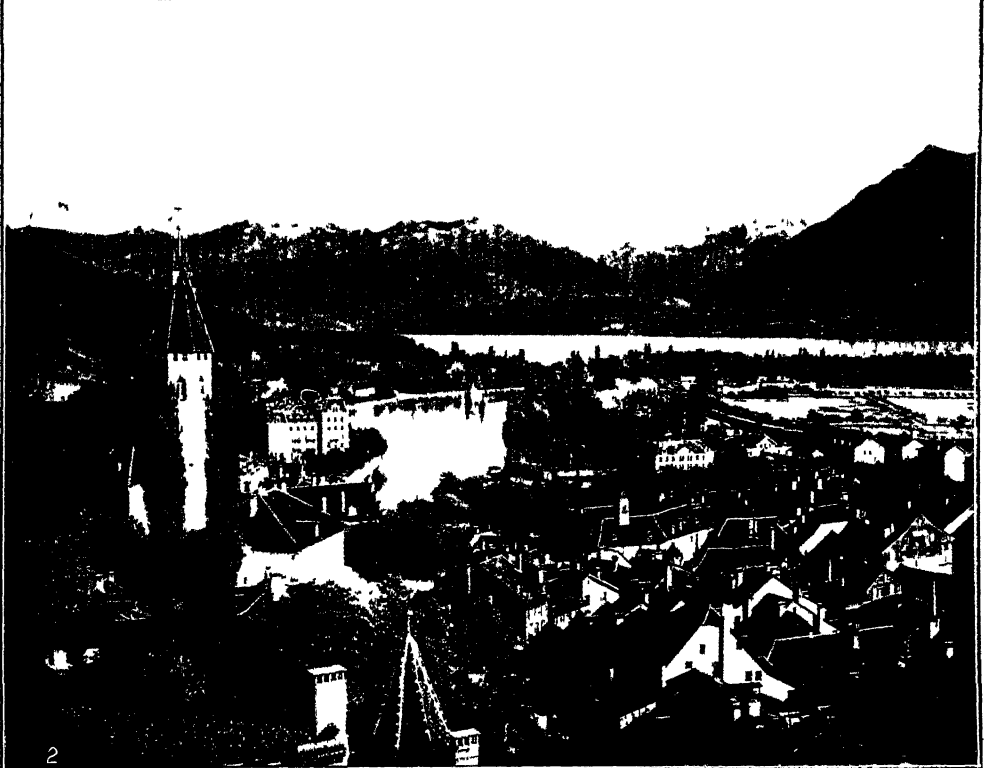
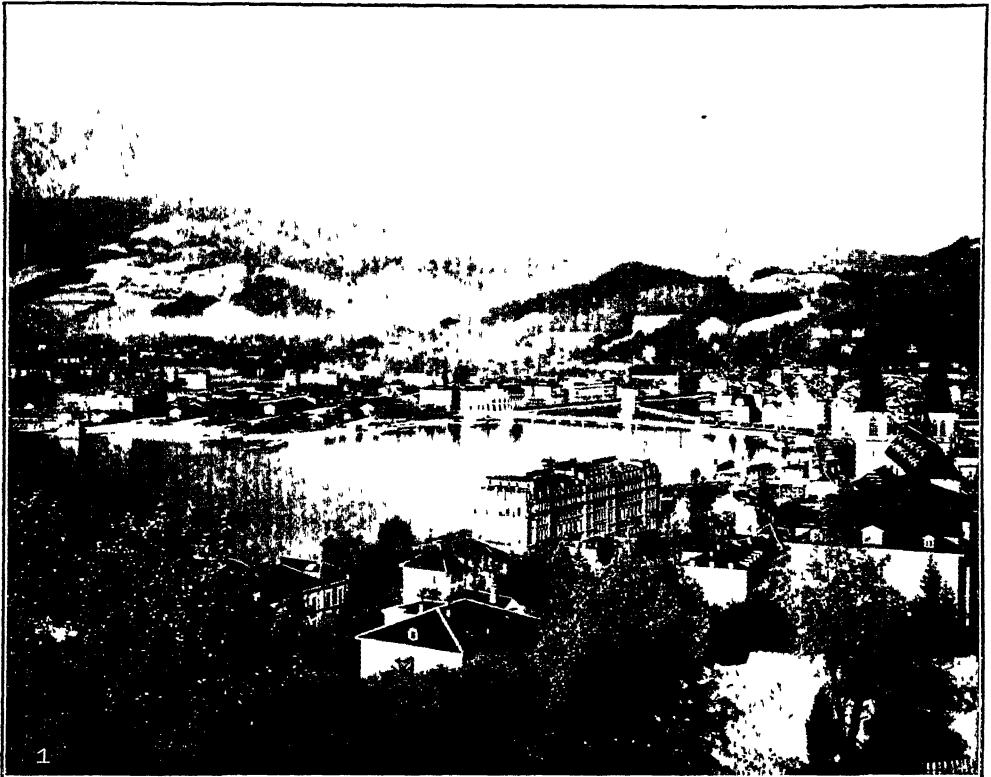
Surinam. See DUTCH GUIANA

Swaziland. A British dominion in the southeastern portion of the Transvaal, South Africa. The area is about 6,530 square miles, and the population (1904), 85,500, about 900 being whites. The seat of Government is at Mbabane. The High Commissioner of South Africa stands at the head of the administration. Prior to 1903 the colony was under native rule, under which a great many companies obtained exclusive mining and other rights, making it necessary for the present government to assume control of such, in the majority of cases, for the preservation of harmonious government. Compensations are given, however. The revenue in 1908 amounted to about \$195,000, and the expenditure to \$285,000. The commissions in charge of the expropriating of concessions created a large part of the expenditure. The public debt amounted in 1907 to about \$100,000. Native tribunals have jurisdiction in matters affecting natives, appeal being had to the Resident Commissioner's court. There are assistant commissioners' courts. The law of the Transvaal prevails in Swaziland. The best crops are maize, millet, pumpkins, sweet potatoes, beans, and ground nuts. Cotton is being experimentally grown. The mining resources are rich, but latent. Tin is mined in some localities, the exportation in 1906-07 weighed 190 tons, and was valued at about \$95,000. A little gold is produced. The trade is carried, for the most part, by vessels. Couriers carry communications, there is a limited telegraphic connection.

Sweden. The monarchy of Sweden occupies the southeastern half of the Scandinavian Peninsula, and from 1814 until 1905 was politically united with Norway.

Area and Population.—Sweden is divided into 24 governments, and the total area is 172,876 English square miles. The total population is 5,476,441 (1910), and averages about 30 per square mile. The increase per year is about

SWITZERLAND



1 Lucerne.

2. Thurn and the Bernese Alps.

SWEDEN — SWITZERLAND

seven-tenths of 1 per cent. Nearly all the population is Swedish, that is, of the Scandinavian branch of the Aryan family, in 1900 there were 22,138 Finns, and 6,938 Lapps. In 1900 the foreign born population numbered 35,627, divided about evenly between Germans, Danes, Norwegians, Finns and Americans by birth, a considerable percentage of those classed as Americans were, however, of Swedish ancestry. The number of emigrants to the United States in 1905 was 8,873, in 1903 it was 21,242. The largest city is Stockholm, with a population of 341,816, next largest is Göteborg, with 162,480, and third on the list Malmö, with 81,120. There are 22 smaller cities and towns, having between 10,000 and 40,000 inhabitants.

Government—The Constitution dates from 1809. The present King, Gustaf V, was born 16 June 1858, and succeeded to the throne on the death of his father, Oscar II, 8 Dec 1907. The heir apparent is the Crown Prince Gustaf Adolf, born 11 Nov 1882.

The King must be a member of the Lutheran Church. His Constitutional power is exercised in conjunction with the Council of State, or, in legislation, in concert with the Diet, and every new law must have the assent of the Crown. The Diet has the right of imposing taxes. It consists of 2 Chambers, both elected by the people, the First consisting of 150 members and the Second of 230. The Council of State is headed by the Minister of State, and the other Ministers are those of Foreign Affairs, Justice, War, Marine, the Interior, Finance, Education, and Ecclesiastical Affairs, and Agriculture; there are also two Ministers without portfolio. Each of the 24 local governments has a prefect nominated by the King; the people regulate their own local affairs.

Finance—The revenue and expenditure for 1910 amounted to about 228,139,000 kronor each. Expenditure for the Church does not appear in the budget, being chiefly defrayed by revenue of landed estates belonging to the Church, and by the parishes. On 1 Jan 1910 the public liabilities, contracted entirely for railways, amounted to about 500,000,000 kronor. The debt amounts to about \$25 per head of the population, but as the receipts from the railways and outstanding loans amount to about the whole interest, the charge per head is nominal.

Army—See ARMIES OF THE WORLD

Navy—See NAVIES OF THE WORLD

Education and Religion—There are two universities, Upsala, with 1,974 students, and Lund, with 967. In 1908 there were 14,226 elementary schools, with 19,925 teachers and 771,626 pupils; 77 public high schools, with 21,865 pupils; 38 people's high schools, with 2,032 pupils; 15 normal schools, with 1,491 pupils; and various other schools; the total amount spent on elementary education was 34,898,782 kronor, of which about one-fourth came from the national funds. Among the recruits of 1907 only 0.63 per cent could not read or write.

The Lutheran Protestant Church is the State religion, and the masses of the people belong to it. Dissenters number 56,844; Roman Catholics, 2,378, and Jews, 3,912. No civil disabilities attach to those not of the State religion.

Agriculture—In 1907 the number of farms in cultivation was 356,916. Of the total area 8.9 per cent of the land is under cultivation, 3.3

under natural meadows, and 52.2 per cent under forests. The farms of 2 hectares and under, number 90,450, those between 2 and 20 hectares, 225,649, those between 20 and 100 hectares, 33,482; and those above 100, 3,260. The following table shows the area under the chief crops and the yield in 1907.

Crop	Area (1,000 hectares)	Yield (1,000 hectolitres)
Wheat...	87 7	2,380 7
Rye	407	9,180 5
Barley	197 1	5,469 2
Oats	810 5	25,645 1
Mixed grain	151 7	5,162 6
Pulse	41 3	830 9
Potatoes....	150 7	27,494 3

The value of all crops was estimated at 787,400,000 kronor, of which cereals amounted to 306,600,000. There were 566,227 horses, 2,628,982 head of cattle, 1,021,727 sheep and lambs, and 878,828 pigs.

Exports and Imports—The timber and woodwork industries are the most important in Sweden, but there is naturally little or no demand for these products in the United States, except in the form of carved and painted toys, which are gaining popularity here. This is also true of the Swedish china, which has a distinct character of its own and is very attractive from its quaintness and fine quality, and the beauty of its coloring.

Manufactures and Minerals—The chief industries aside from agriculture are the sawmills, wood pulp mills and paper factories. The sawmills in 1907, employed 40,912 workmen; the furniture factories, 11,921; wood pulp mills, 11,058; and paper mills, 7,725. There are also sugar refineries, brandy distilleries, margarine factories, breweries, flour mills and other shops which supply the needs of the people and produce a surplus for export. Mining is an important industry, and in 1908 there were 31,754 persons engaged in it, and 4,713,160 tons of iron ore were mined. In 1907 there were mined 2,058 tons of silver and lead ore, 21,371 tons of copper ore, 40,077 tons of zinc ore, and 29,569 tons of sulphur pyrites.

Communications—The Swedish mercantile marine in 1908 comprised 2,968 vessels, of 771,257 tonnage, the port of Göteborg having the largest shipping, and Stockholm next. In 1907, 118,327 ships and boats passed through the canals of Sweden. The total length of railways was 8,458 miles, 2,717 miles belonging to the State. There were 19,924 miles of telegraph, and 200,000 miles of telephone lines; 16,935 miles of telegraph belonging to the State. There were 2,660 telegraph offices and 3,735 post offices.

Social Conditions—The administration of justice is entirely independent of the Government. In Sweden, trial by jury exists only for affairs of the press. At the end of 1907 there were 1,445 hard-labor prisoners. The poor are assisted by the local commune. In 1907, 229,693 paupers were assisted, of whom 82,439 were in the towns. There are workhouses numbering 1,921, which can lodge 58,748 people. Each commune and town constitutes a poor district, and in each is a board of public assistance. Children under 15, and persons unable to support themselves, are entitled to assistance by the commune.

Switzerland. Switzerland is a small inland republic in the central part of Europe, originating in a league formed for defense in 1291 by

SWITZERLAND

the men of Uri, Schwyz and Lower Unterwalden. In 1048 the League became independent of the Holy Roman Empire, and in 1798 the Helvetic Republic was formed, in 1815 the perpetual neutrality of Switzerland and the inviolability of her territory were guaranteed at the Congress of Vienna.

Area and Population—There are 22 cantons in the Confederation, and the total area is 15,976 square miles, the total population, at the last census, was 3,559,349, an average of 207.5 to the square mile. In 1909 the population of the principal towns was as follows: Zurich, 183,500; Basel, 129,600; Geneva, 121,200; Berne, 78,500; Lausanne, 60,000; St. Gallen, 55,400; there are five other towns with between 20,000 and 50,000 population. The number of foreigners in Switzerland was 392,896.

In 15 of the cantons German is generally spoken, French in 5, Italian in Ticino, and Rumance and Italian, although in Graubunden. Most educated Swiss speak at least three or four languages, and the Swiss in general are considered the greatest linguists in Europe. For that and various other reasons, chief among which is their excellent business ability, they are the great hotel-keepers, couriers and hotel employes of Europe, and also of the largest American cities. It is common for the sons of Swiss hotel-keepers to take employment in hotels in all the largest cities of Europe in succession, thereby becoming familiar with the customs of every country, as well as its language. While hotel-keeping is indisputably one of the important and profitable occupations of Switzerland, the number of persons engaged in it in that country is comparatively small. The chief industries listed, by numbers, are agriculture, building, and textile work; commerce, hotels, etc., come next on the list as occupying 140,000 persons.

The surplus of births over deaths in 1908 was 38,544. The number of emigrants in that year was 3,656. Nearly all the resident foreigners are engaged in some profession, or dependent on those so engaged.

Government.—The present Constitution dates from the last revision in 1874. Legislative and executive authority are vested in a parliament of two chambers, the Ständerath or State Council, and the Nationalrath or National Council. The first is composed of two members for each canton, and the second of 167 representatives chosen directly, one deputy for every 20,000 souls. A general election takes place every three years. The chief executive authority is deputed to a Bundesrath or Federal Council, consisting of 7 members, elected for three years by the Federal Assembly. The President of the Confederation and the Vice-President of the Federal Council are elected for one year, by the Federal Assembly, and not re-eligible to the same offices till another year has expired. The Vice-President, however, often succeeds the outgoing President. The President in 1910 was M. Robert Comtesse and the Vice-President, M. Marc-Emile Ruchet. Berne is the seat of the Federal Council.

The greatest liberty is allowed the cantons in their local government, which is based on the principle of absolute sovereignty of the people. In some of the small cantons, as Appenzel, Uri and Unterwald, the people exercise their powers direct, meeting in the open air;

these assemblies are known as the *Lands-gemeinden*.

Finance—The revenue for 1910 was estimated at \$31,135,700, and the expenditure to \$31,768,500. The public debt in 1909 amounted to \$24,886,000.

Army—See *ARMIES OF THE WORLD*.

Navy—See *NAVIES OF THE WORLD*.

Education and Religion—Education is free and obligatory, and most of the cantons had a system of primary schools before 1848. The number of primary schools is 4,647, of infant schools, 929; secondary schools, 606, middle schools, 37; and normal schools, 46, the total number of pupils in all schools is 620,441. There are various technical and special schools, including 7 institutions for the blind, 15 for the deaf and dumb, and 25 for the feeble-minded. There are also numerous private schools, especially pensions for girls, and some of these are famous throughout the world. There are also 7 universities, as follows: Basel, founded 1460, with 669 students, Zürich, 1832, with 1,474; Berne, 1834, with 1,626; Geneva, founded as an Academy, in 1559, and as a university in 1873, with 1,452; Lausanne, founded as an Academy in 1537 and as University in 1890, with 964; Fribourg, 1889, with 604; and Neuchatel, founded as an Academy in 1866 and as a University in 1909, with 169. Over 1,100 women students are included in this list.

There is absolute liberty of creed, but no bishoprics can be created in Switzerland without the approval of the Confederation. The Order of Jesuits cannot be received, and any other religious orders deemed dangerous to the State can be interdicted from clerical and scholastic functions. In 1900 there were 1,916,157 Protestants, 1,379,664 Roman Catholics, and 12,264 Jews. Protestants are in the majority in 12 cantons, including the more populous; Catholics are in the majority in 10, including the Forest Cantons. The Protestant Church is Calvinistic in doctrine and Presbyterian in form.

Agriculture—About 473,000 men and women are employed in agriculture, and with their dependents the agricultural workers number 1,067,905. Nearly the whole of the arable land belongs to peasant proprietors, of whom it has been estimated that there are 300,000. Fully 28 per cent of the total area of Switzerland is unproductive, and with a population less thrifty, industrious and ingenious than the Swiss, a much larger proportion would remain uncultivated. About 36 per cent of the productive area is under grass and meadows; 29 per cent under forest; 18.7 per cent under fruit; and 16.4 per cent under crops and gardens. Rye, oats and potatoes are the chief crops, most of the food-stuffs consumed in the country being imported. The making of cheese and condensed milk, and in five of the cantons, wine, and in three, tobacco, form the chief productive agricultural industries. In 1906, there were in Switzerland, 135,372 horses, 1,498,144 cattle, 209,997 sheep, 548,970 pigs and 362,117 goats. The whole forest area is 3,290 square miles; over about half of this, Federal supervision extends, and in 1874 it was decreed that this forest area should never be reduced. There were, in 1909, 188 establishments for pisciculture, producing fry to the number of 64,259,500.

Exports and Imports.—The imports and exports in 1908 were as follows, by countries:

SWITZERLAND.



1 Mt Blanc

2 St Gotthard Pass and Bridge

SWITZERLAND — SYNCHRONIZATION OF PHONOGRAPH

Country	Imports from (francs)	Exports to (francs)
Germany.	512,701,560	239,880,589
France	283,576,909	117,211,131
Italy	171,852,466	92,184,515
Austria-Hungary..	98,935,343	64,953,663
Great Britain	87,012,047	178,537,621
Belgium	31,354,479	18,521,654
Russia	49,576,198	32,813,828
Holland	10,994,330	8,069,148
Rest of Europe	53,371,047	51,399,631
Africa	22,297,640	12,722,219
Asia	36,225,225	38,914,412
America	112,894,967	179,587,840
Australia	10,457,046	5,963,440
Total ..	1,487,149,157	1,038,437,322

The chief exports are cotton and woolen goods, cheese and condensed milk; the chief imports, cereals and other foods, silk goods and mineral substances.

Manufactures and Minerals—There are 5 salt mining districts, and the output is about 580,349 quintals per annum. The output of cement in 1909 was 583,367 metric tons. About 242,550 persons are employed in arts, trades, industries, and commerce, and 71,413 in domestic industries.

Communications—Switzerland had in 1908 a total of 3,170 miles of railway lines and tramways. In 1909 there were 1,950 post offices and 1,964 letter boxes. The system of telegraphs is very complete, comprising 2,280 miles of line. There are 2,350 offices. The 414 telephone systems have 10,560 miles of line.

Social Conditions.—Each canton has its own judicial system for ordinary civil and criminal trials, and there is a Bundes-Gericht or Federal Tribunal which sits at Lausanne. On 31 Dec. 1907, the prison population consisted of 3,869, of whom 527 were women. In 10 of the cantons, capital punishment exists. While poverty is common in Switzerland owing to the nature of the land, pauperism is not, unless in remoter districts. A peculiar ailment known as goitre is apt to affect villagers in some of the valleys where the steep mountains shut out the sun, and this causes, in such villages, enough dependence to be a serious burden on the unaffected part of the population. The innumerable hotels of Switzerland give employment to some thousands as domestics, guides or porters. A cottage industry of some importance is the carving of wood and ivory, which is done very cleverly in some districts. Switzerland was one of the first countries to improve and perfect the manufacture of clocks, watches and mechanical toys of all kinds, and her people have for centuries been celebrated for their mechanical cleverness. They are a thrifty, sturdy and independent race, and do not easily sink into conditions of abject poverty; moreover, it is comparatively easy for the more enterprising and youthful members of a family to earn enough for the support of the rest, so that the problem of poverty does not assume as serious an aspect as it does in countries of equal scarcity of resources where opportunities are lacking.

History, 1910—On 15 Dec 1910, the Swiss Federal Assembly in joint session of the National and State Councils elected Marc-Emile Ruchet President of the Swiss Confederation for 1911, and Louis Forrer was made vice-president. M. Ruchet was formerly vice-president of the Federal Council and chief of the department of the interior. M. Forrer was President in 1906. Robert Comtesse was President in 1910.

Attention was attracted to Switzerland in 1910 on account of the suggestion of the Swiss Society of Public Utility for Women, that all persons be physically examined by the government as to health. The particular point of interest lay in the examination of contracting parties before marriage, to promote the health of the nation. It was not suggested that marriage be forbidden between unhealthy people, but that each should know the exact physical condition of the other. The Swiss Society of Public Utility for Women is a powerful organization which has been able to carry into effect most of the projects which it has fostered and has done a great deal towards protecting women. This, however, was the most advanced step taken by the organization and interest was aroused in this country, particularly on account of the attempt of medical societies to secure State legislation with the same object in view.

On account of the adoption of the initiative and referendum, as the basis of governmental reform in this country, attention has been repeatedly called to Switzerland by American reformers who have accredited Switzerland's freedom from official corruption to this powerful weapon in the hands of the people. This argument was strengthened during 1910 by the disclosures of the conditions in the one Swiss canton which has not the initiative and referendum, Fribourg, the canton in question, it was disclosed, was completely in the grasp of Georges Python, its political boss, whose methods were similar to those employed by American bosses. During the year a petition was signed by a large body of voters and laid before the Grand Council seeking to have the initiative and referendum put to a vote, but the question was not raised, on the veto of Python. It was shown that he holds himself in power by distributing political favors, and that the election returns are always strengthened in behalf of the candidate he has put forward, by large bodies of voters who are carefully collected and taken to the polls by Python's political henchmen. One instance of the misgovernment under his control is an electrical plant, estimated at 3,000,000 francs, the actual cost of which was 12,000,000 francs.

Switzerland's parliament, which is elected on the basis of one deputy to every 20,000 of population, was composed in 1910 of 103 Radical-Democrats; 34 Catholics; 16 Liberal-Conservatives; 17 Socialists; 12 Politico-Socials, and 2 unclassified by party. To seat this body in regular order is not attempted, and the apparent confusion is added to by the fact that three languages are spoken. Most of the members, however, can speak the various languages, and the progress of legislation is not hampered in this respect. The national council reports are issued in German and French, and Italian is largely used. Each orator always speaks his own language. The State Council has much less business than the National Council. The Federal Council being elected for three years, the political intrigues and debates which characterize the French Parliament are lacking.

At Berne, the center of Federal government, it was found necessary to build additional buildings which were constructed on simple modern lines rather out of keeping with the rest of the city.

Synchronization of Phonograph and Cinematograph. M. Gaumont, a Frenchman, suc-

ceeded during 1910 in bringing about an exact synchronization of the phonograph and cinematograph. Various scientists, including Thomas A. Edison, have been working on this problem for more than 15 years. At a session of the French Academy of Science the instrument was shown and labeled "the talking cinematograph." The screen showed an orator on the platform speaking and the accompanying phonograph reproduced, simultaneously, the words being spoken. Synchronism is solved by a special system of connections, which conveys, through two dynamos that control the action, a speed which is absolutely the same. The method by which exact connection is obtained has not been divulged.

Syndicalism. Syndicalism is the name commonly given to a movement which demands the basing of all political organization on the more stable and far-reaching economical organization. To an extent anarchistic in its origin, syndicalism has until recently been narrowly "proletarian" in its appeals. In France, Belgium and the Scandinavian countries, it may be said to have assumed an openly hostile attitude towards existing institutions. Its spread has been remarkably rapid and has given rise to grave apprehensions on the part of those who see a guarantee of orderly progress only in the parliamentary representation. It is significant, however, that during the last few years one middle-class writer after another has been coming forward and going out of his way to advocate syndicalism. The explanation for this lies in the feeling, growing persistently in many quarters, that political institutions are at heart tied up with economic interests, and so cannot be reformed, where a reform is considered necessary or advisable, until this condition becomes generally admitted and applied.

On 12 June 1909, about 6,000 representatives of industry, trade, commerce and finance gathered in the Circus Schumann at Berlin and formed a Hanseatic Union for Trade, Commerce and Industry, intended to act as a balance against the aristocratic agrarian Union of Landed Proprietors. The avowed object of this new organization was to protect the interests of the economical groups already mentioned and to protect the interests of all such societies to nominate candidates from their own membership for the national parliament as well as for the various state diets. If this new institution should prove itself capable of growth, then the political life of Germany will have not less than three great economical organizations armed for mutual struggle. These are as follows: (1) the Agrarian Union; (2) the Hanseatic Union; and (3) the Social Democracy. The partisans of syndicalism aver that this is probably the clearest indication of future political development and the form which the latter will assume that has so far been observed in any country of the world. Although rather radical, the chief tenets of syndicalism are shown in the words of one of its staunchest and most worthy exponents who says, writing in *Gads Danske Magasin*: "With or without revolutions help must come through a reform of the representative system. The special advantage of this system over autocracy lies in the very fact that, while autocracy cannot be reformed without ceasing to be autocratic, the representative system may be said to contain unlimited possibilities of modification and improvement. We

have tried one way, and it has not proved to be the right one. Therefore, another one has to be tried. An abundance of crushed illusions ought to have taught us that politics have but little to do with ideals, and that what determines everything in the end are the solid material interests of the different classes. Nothing can then seem more natural than an effort to exploit the motive power inherent in class egoism in a rational manner for the good of society. This may be done by letting each economical group fight for itself, and by using the constitution, as well as a special national representation, to keep those interests within control and to represent the nation in its dealings with the outside world. The desired results might be obtained through a system of two houses, in which the lower house should represent class interests, while the upper one represented territorial divisions."

Syphilis, New Cure for. The year 1910 will always be remembered by reason of a most important discovery in medical science, which has been named "606." For centuries, syphilitic infection has been the scourge of humanity; it has been considered virtually incurable. Its effects may remain dormant for years, only to show themselves later in life, or even in the lives of the descendants of those affected. So widespread has this disease become, indeed, that the popular saying among medical men, "civilization and syphilis", has more than justified itself. While the symptoms have been more or less palliated in the past, either by means of the mercury treatment, or by reason of years of hygienic living, there always remained the germ of the disease, which no measures seemed to eradicate and which, sooner or later, in the majority of cases, showed itself in general paralysis, syphilitic degenerations and consumption, or, as we have said, was communicated to the offspring years after the last trace of the disease had been eradicated in the parents. The numbers affected by this dread malady is appalling. (Consult 'Action on Prostitution,' 1869; Sanger, 'History of Prostitution,' 1897;) but no hope of a permanent cure has ever been vouchsafed. Fournier, the greatest living authority of syphilis, advised the mercury treatment, while acknowledging that it was in many cases merely palliative, and that its effects were always doubtful. So called "specifics" have one and all proved useless, if not harmful. Thousands of the youth of each generation have been wrecked by this insidious disease and the scarcely less insidious treatment.

But now, Dr. Paul Ehrlich, Director of the Royal Institute for Experimental Therapeutics at Frankfurt-on-the-Main, has at last discovered a remedy which is said to be permanent and almost instantaneous. It is a preparation of arsenic, and is the result of 15 years of constant study and experiment. The chemical name of this curative agent is dioxidamidoarsenobenzol. It is popularly known as "606," for the reason that 605 unsuccessful preparations had been made by Doctor Ehrlich prior to this successful preparation, which was thus his 606th compound. It is not a serum, but a definite chemical mixture, or compound. Some years ago, Doctor Ehrlich discovered that arsenic had a destructive effect upon certain micro-organisms in the blood, which appear in certain diseases, such as the sleeping-sickness, malaria, and others. Doctor Ehrlich conceived the idea that

a dose of arsenic sufficiently strong to kill the organisms, but not strong enough to destroy the living tissue, would be successful. Accordingly he set to work, and on his 606th trial succeeded. He tried the remedy first on animals, and, finding it successful, he sent a supply of it to various clinics throughout Europe, in which it was tried on more than 3,000 cases. In 95 per cent of the cases a cure seemed effected, and there is reason to believe that the failures were due to the fact that too small a dose had been administered at first. Lesions which had resisted other treatment for years were at once healed, the effects of the drug seemed almost miraculous. One treatment was sufficient; whereas months and years of doctoring had previously been required, and without any surety of the ultimate result.

The preparation comes in the form of a powder, which is dissolved in a special manner and then injected under the skin of the patient. The patient is then put to bed for four or five days under observation, and in that time an improvement is noticed in most of the cases. In the successful ones, the active symptoms of the disease disappear often within two to six weeks. There seemed good reason to think that the cures were permanent,—lasting as long as the life of the patient; but inasmuch as only a few months have elapsed since the discovery of the drug, this could not at the time, of course, be stated positively.

There is virtually no risk attached to the treatment; but it is not employed in those cases where the heart or the kidneys are weak, since its effects are depressing. In all normal cases, these effects are not observed. The remedy is also destructive of other forms of spirilla in the blood—and good results have come from its experimental use in epilepsy, malaria, varicella, smallpox, and various tropical affections. Within 48 hours the spirilla have usually disappeared; and after that, the disease disappears rapidly. Professor Alt, of Uchtspringe, has stated that nervous affections, due to blood affection, are greatly benefited by the new treatment. He suggested that it might be found

of great value in locomotor-ataxia and kindred affections. Professor Iverson, of St Petersburg, has reported favorable results in malaria and other blood diseases. Professor Wechselman of Berlin, Emmery of Paris, Sohni of Tokio, Grunfeld of St Petersburg, Michælis of Berlin, and others, have reported startling results with the new remedy. It is generally conceded that, even if not a specific for diseases of parasitic origin and blood infection, it is certainly a new, very effective and most important remedy in cases that have resisted the methods hitherto employed.

In spite of the fact that such surprising and such good results have been obtained with "606," however, there is reason to believe that in many of the early statements, the facts were somewhat over-estimated, and that a more careful revision of the original statement is necessary. This is always the case when any new medicine is introduced, and need not surprise us. Certain it is that the new remedy has worked wonders, and done all that is claimed for it, in many cases. There are others, however, which the drug has failed to help. In many instances, after an apparently successful injection, a relapse has followed in one or two months, showing that the cure has not been complete. Nearly all the physicians who have used the drug extensively have reported relapses, and, on the whole, enthusiasm waned some months after the drug was placed on the market. Doctor Geronné of the City Hospital in Wiesbaden, had 22 relapses in 71 cases treated by him, between April and July 1910; he believes that "606" will have to be supplemented by mercury, as heretofore. Professor Bruhns of the Hospital Charlottenburg, Berlin, refers to several cases which responded poorly to "606," and showed greater improvement under mercury. On the whole, therefore, there is a growing tendency to believe that "606" will have to be given in conjunction with other remedies; though the treatment is acknowledged to be wonderful in its effects, and in some instances almost miraculous. The great danger, at present, consists in the possibility of a relapse.

TAFT, William Howard. President of the United States: b. Cincinnati, Ohio, 15 Sept 1857. He prepared for college at the Woodward High School, and was graduated at Yale in 1878, standing second in a class of 120, and with the honor of being salutatorian and class orator. He then studied at the Law School of Cincinnati College, graduating in 1880 and was admitted to the Ohio bar the same year. He was at this time a law reporter for the Cincinnati *Times*, and later the Cincinnati *Commercial*. In 1881-82 he was assistant prosecutor of Hamilton County, Ohio; and in 1882, collector of internal revenue, first district of Ohio (resigned). From 1883 to 1887 he practiced law in Cincinnati, and served during part of this time as assistant county solicitor. From 1887 to 1890 he was a judge of the Superior Court of Ohio; and from 1890 to 1892 solicitor general of the United States. In 1893, Yale College conferred on him the degree of LL.D. From 1896 to 1900 he held the position of dean and professor in the law department of the University of Cincinnati; while from 1892 to 1900 he was United States Circuit judge

for the 6th circuit. From 13 March 1900 to 4 July 1901, he was president of the United States Philippine Commission, and from 4 July 1901 to 1 Feb. 1904 served as first civil governor of the Philippines. In 1902 President Roosevelt sent him to Rome to confer with Pope Leo XIII concerning the purchase of agricultural lands owned by religious orders in the Philippines. In 1903, he declined an appointment from the President as associate justice of the Supreme Court of the United States; but accepted the appointment as Secretary of War, and served in this capacity from 1 Feb. 1904 to 30 June 1908. The President sent him to Cuba in 1906 to adjust insurrection there and act temporarily as provisional governor. In March and April 1907 he went to Panama, Cuba and Porto Rico to examine various conditions, and then to Japan and the Philippines, returning by way of Russia.

He was nominated for President of the United States by the Republican National Convention at Chicago in June 1908 and elected 3 Nov 1908, for the term from 4 March 1909 to 4 March 1913, receiving 321 electoral votes

TAFT

against 162 for William Jennings Bryan, the Democratic candidate. On 4 March 1909 he was inaugurated as President, with James Schoolcraft Sherman, of New York State, as Vice-President. He succeeded to the Roosevelt policies. In his inaugural address he announced necessary reforms in laws governing railways and trusts, but considered the revision of the tariff most important, for which an extra session would be summoned 15 March. He wanted a tariff for an adequate revenue, and with duties adjusted in such a manner as to give protection to labor and to all the industries of the country; a tariff equal to the difference between the cost of production abroad and that in the United States, and having a provision putting into force, upon executive determination of certain facts, a higher or maximum tariff against those countries whose trade policy toward the United States equitably required such discrimination. He stated that, owing largely to the business depression which followed the financial panic of 1907, the revenue from customs and other sources had so decreased that there would be a deficit for the current fiscal year of \$100,000,000. Should it be impossible to secure an adequate revenue by import duties, new kinds of taxation must be adopted, and among these he recommended a graduated inheritance tax.

He urged that the army should be "so organized and so officered as to be capable in time of emergency, in cooperation with the national militia, and, under the provisions of a proper national volunteer law, rapidly to expand into a force sufficient to resist all probable invasion from abroad and to furnish a respectable expeditious force, if necessary, in the maintenance of our traditional American policy which bears the name of President Monroe," and that the country should possess a strong navy as the best conservator of peace and the best means of securing the national rights, interests and influence. The foreign policy of the United States, he said, was always to promote peace; to make every effort, consistent with national honor, to avoid a resort to arms; to favor arbitration, to maintain peace and to avoid war.

"But with all the nations of the world armed and prepared for war," he said, "the United States must be in a similar condition. In the International controversies that are likely to arise in the Orient, growing out of the question of the open door and other issues, the United States can maintain her interests intact and can secure respect for her just demands. She will not be able to do so, however, if it is understood that she never intends to back up her assertion of right and her defence of her interest by anything but mere verbal protest and diplomatic notes. . . . Our Government is able to afford a suitable army and a suitable navy. It may maintain them without the slightest danger to the Republic or the cause of free institutions, and fear of additional taxation ought not to change a proper policy in this regard."

President Taft appointed the following Cabinet: Secretary of State, Philander Chase Knox, of Pennsylvania; Secretary of the Treasury, Franklin McVeagh, of Illinois; Secretary of War, Jacob McGavock Dickinson, of Tennessee; Attorney-General, George Woodward

Wickersham, of New York; Postmaster-General, Frank Harris Hitchcock, of Massachusetts; Secretary of the Navy, George von Lengerke Meyer, of Massachusetts; Secretary of the Interior, Richard Achilles Ballinger, of Washington; Secretary of Agriculture, James Wilson, of Iowa; Secretary of Commerce and Labor, Charles Nagel, of Missouri.

Congress met in extra session 15 March 1909, but the new tariff bill was not passed until 5 August. It is known as the Payne-Aldrich Bill. In September 1909, President Taft began a two months tour which took him through almost every State of the Union. He spoke in Denver on the distribution of great fortunes, and on the corporation tax which had been adopted instead of an income tax. At Salt Lake City, in the pulpit of the Mormon Tabernacle, he delivered an address on the text "A soft answer turneth away wrath," deprecating intolerance of opposite opinions, and urging less acrimony in public discussion, more charity as to motives, and abstinence from charges of dishonesty and corruption until there was a real reason for making them. At El Paso, Texas, 16 October, he set aside the precedent for a President never to leave the United States. He crossed the Rio Grande and made a formal visit to the President of Mexico, and later this visit was returned by President Diaz.

When Congress met in Dec. 1909, President Taft called attention to a special agreement between the United States and Great Britain to submit to the Hague Tribunal the fisheries articles of the Treaty of 1818, which had been in dispute between the two countries for about 70 years. He insisted also on the growing expansion of American trade and investment in foreign countries as imposing vastly increased responsibilities on the United States Government; and that, therefore, the relations of the United States with Latin America especially were a matter of extreme importance in view of the Monroe Doctrine. His message deplored the delays in the administration of civil and criminal law which had already received the attention of committees of the American Bar Association and many Bar Associations of the States. A change in judicial procedure, with a view to reducing its expense to private litigants in civil cases and facilitating despatch in all cases, he said, constituted the greatest need of the American institutions. His judicial knowledge made his recommendations in this direction of special value. He recommended also the establishment of postal savings banks as necessary to induce thrift and saving by persons of small means.

President Taft's decisive action was felt by settling a dispute among executive officials in Washington, in his removal from office of the chief of the Forest Service, Mr. Pinchot, whom he held responsible for instigating L. H. Glavis, chief field inspector of the Interior Department, and others, to critically assail Secretary Ballinger and inferentially the President.

The salary of the President was increased during the session of Congress from \$50,000 to \$75,000 a year, and an appropriation of \$25,000 a year was made for his traveling expenses.

President Taft had long urged free trade between the Philippines and the United States as vital for the prosperity of the Islands, and in one of his speeches on his Western tour he

Taft — Tariff Board

said that in this the United States had finally done justice to the Philippines. On 17 Jan. 1910 he addressed a meeting of the National Civic Federation at Washington upon the defects of American judicial procedure. He urged an active policy of conservation of national resources, and agreement between the States to establish uniformity of legislation. In an address at a dinner of the Republican Club of New York he spoke upon the question whether the actual and proposed restrictions upon corporations were hurtful to business, and he defended the pending legislation in Congress in this connection. On 28 January at a banquet of magazine writers and publishers, he warned them against overemphasis and undue superlatives, which caused readers to be indifferent as to what they read.

From 16-23 March, he made another long trip. In his address at Rochester, he said, "it was absolutely necessary to carry through the pledges of the Chicago platform, especially because a new tariff was supposed to be very dangerous for the party that made it, and that the corporation tax, with the proposed withdrawal of the pound rate on newspapers, and the postal savings proposition, had raised up enemies for the Government." On 20 March he consulted with the Canadian Minister of Finance regarding a maximum tariff. On 22 March, in New York, he stated that he stood for universal peace and arbitration and recommended the building of two battleships yearly. From 29 April to 5 May he made a tour with Secretary Knox, repeating his conservation plea at Buffalo, and at Passaic on 9 May he defended the railway bill then pending, and other measures included in his program. On 3 June, at the Ohio Northern University, he spoke regarding the "intensity with which lawyers had served their clients and the lightness of the obligation which they have felt to the court and to the public." On 4 June, at Jackson, Mich., at a celebration to commemorate the birth of the Republican party, the President declared that while Socialism was a great problem, government by parties and yielding to the will of the majority were the only protection against the nation breaking up into small groups. On 6-7 June, he held a conference in Washington with the presidents of leading railroads and obtained their agreement that they would suspend any increase in rates pending the decision by the Interstate Commerce Commission on this subject. On 23 June he wrote to the president of the Brotherhood of Locomotive Firemen and Engineers that he was opposed to making any exception in the case of labor unions in applying the general principles of the Sherman Anti-Trust Law and other restrictions on corporations.

He established a summer residence at Beverly, Mass., on 28 June 1910, and he received informal visits there from Colonel Roosevelt and other distinguished men. On 4 July he addressed the National Educational Association in the Harvard Stadium, regarding the government of the Philippine Islands and its educating effect in leaving the Filipinos to assume their own government. On 5 August he delivered an address at the dedication at the Pilgrim monument at Provincetown. On 28 August he wrote a letter summing up the legislation of Congress, for use in the Republican Campaign book, com-

paring this legislation with the platform pledges and stating that it "has in its course set higher the standard of party responsibility for such pledges than ever before in the history of American parties." He defended the Payne-Aldrich tariff, but with qualifications. He considered it a decided step in the right direction, as it was the first act that recognized the necessity of reducing rates in order to deal with manufacturers who combined to keep up prices to the highest point possible short of incurring foreign competition. He also explained the difficulties of carrying out the conservation program, there being a disposition on the part of the public to ask the Government to drain swamp lands and the property of states and individuals. He was careful, however, not to commit himself to Federal control of water powers.

On 15 September he announced that he would give patronage freely to both insurgents and regulars. Later in this month, at the Ohio Exposition at Cincinnati, he denounced "log-rolling" for internal improvements, and said that he would veto bills which he thought not for the public good. Other subjects to which he gave attention at this time were the classification of postmasters, the distribution of immigrants to different entry ports, the limitations of the constitution, and the powers of the States. On 10 November he sailed from Charleston on the warship *Tennessee* for Panama, where he inspected the canal. His most important measure under consideration at the close of 1910 was reciprocity with Canada, which he heartily endorsed.

Tariff Board, United States. The inability of Congress to arrive at a tariff, which covered the entire subject and met with the approval of all classes of people, resulting in 1910 in the formation of a tariff board, composed of James B. Reynolds, Alvin H. Sanders and Henry C. Emery, chairman, whose duty is to gather all information on the tariff question available and present it to Congress in such a manner that a clear understanding can be had.

The principal work of investigating the industrial effects of the tariff has been divided by them into three main parts, requiring three sets of investigators. The first part is the collection of facts regarding each dutiable article, showing the character and location of its production at home and abroad, statistics of output, imports and exports, rates of duty reduced to ad valorem terms, etc. The second part is the collection of data regarding cost of production at the mill. The third is the obtaining from the best experts available information regarding home and foreign prices, local variations in each industry, and the general condition of competition at home and abroad.

The first part of this work will be pushed rapidly, but the second and third parts must be concentrated on a few main lines of inquiry and carried on with caution until a basis of knowledge is obtained, when it will be possible to obtain the whole of the information desired without fear of being deceived.

The chief public interest has been centered in Schedule M (paper and pulp), Schedule K (wool and woollens); and Schedule G (farm products). The board, however, is approaching the problem from a purely scientific aspect, entirely aside from the public attitude. Pre-

liminary work began first on Schedule A (chemicals) and Schedule C (metals and manufactures of metals) and Schedule I (cottons). A great army of specialists scattered throughout this country and Europe began work early on many lines of inquiry. The work was the more easily started because of the Government boards connected with European countries which had been engaged in the same work for a quarter of a century and had trained many men fit for making these investigations.

The point of view of the tariff board in approaching its work was that the matter of tariffs is one of business and not mathematics. The problem of how an industry needs protection to keep it in sound existence or what the effect of its decay could be, is a practical problem, and the material on the subject which will be gathered by the board will be of a character to show the competition in each industry, gathered from those who have followed the industry for a life time, so that Congress can arrive at a fair tariff which will not discriminate in favor of certain interests and not do any industry an injury.

Great difficulties beset the tariff board, especially in the securing of accurate cost figures, partially because the manufacturers have not always been able to arrive at accurate figures themselves and partially on account of unwillingness to give exact information, for business and other reasons. Figures of relative cost, which are more easily obtained, are not sufficiently accurate to form a basis for tariff legislation. The board will not attempt to summon witnesses before it and obtain information by coercion. Its method will be, rather, to follow out independent lines of investigation. They will take the attitude that protection is a favor extended by the Government, and not a right, and place the burden of proof on manufacturers to show that they deserve this favor. In this way they will secure willingly much information which, otherwise, would come harder. Chairman Emery in an address before the Association of Commerce of Chicago, propounded the four following questions and proceeded to answer them. (1) Is all this information necessary?, (2) What will it amount to?, (3) Can it be obtained?, (4) What can be done with it? In answer, he pointed out that this information is essential to a thorough understanding of the tariff subject and will actually form a basis for fair judgment regarding tariff rates. He affirmed that it could be had quite adequately and was bound to have an important effect on present action and public policy in the future. But, he pointed out, the work could not be carried out to its proper extent unless the public understands the magnitude of the undertaking, the limits within which it must be confined, the patience which is required, and the futility of expecting to arrive at impossible results. The Tariff Board came into existence when it became apparent that the existent means of acquiring information on tariff questions was inadequate.

Tarkington, Newton Booth. American author b Indianapolis, Ind., 29 July 1869. Graduating from Princeton University A.B. 1893, A.M. 1899, he engaged in a literary career. His style became immensely popular and his novels ranked among the first sellers. They include 'The Gentleman from Indiana' (1899),

'Monseigneur Beaucaire' (1900); 'The Two Van-revels' (1902); 'Cherry' (1903); 'In the Arena' (1905); 'The Conquest of Canaan' (1905); 'The Beautiful Lady' (1905); 'His Own People' (1907); 'Beasley's Christmas Party' (1909). He collaborated with Harry Leon Wilson in the dramatization of 'The Man From Home' (1910). His dramatization of Monsieur Beaucaire, was produced by Richard Mansfield, and became one of that actor's repertoire. He was made a member of the National Institute of Arts and Letters.

Tasmania. A Pacific island, lying off the coast of South Australia, with an area of 26,215 square miles, and population of about 185,800. Tasmania is the well-known Van Diemen's Land; it was discovered by a Dutchman, Tasman, in 1642. The climate is healthy and pleasant. Women vote in Tasmania. The Governor is assisted by a Council. He is appointed by the Crown, and receives a salary of \$13,750 per annum. There are a Legislative Council and a House of Assembly, the former with 18 members, and the latter with 35 members. The government seat, Hobart, has about 44,600 inhabitants. The revenue for 1908-09 amounted approximately to \$4,670,000, and the expenditure to \$4,800,000. The public debt in June 1909 amounted to about \$50,670,000. At the beginning of 1909 there were 32,700 Roman Catholics in the island, 90,300 Episcopalians; 26,900 Methodists; and 12,400 Presbyterians. There is a department of education, which has charge of 350 State schools. The principal products are wool, gold, silver, copper, tin, lead, coal, timber, fruit and sheep. Wild animals exist. There are the kangaroo, wombat, wallaby, tiger, and opossum. Live stock includes 1,728,050 sheep, 295,830 cattle, 39,300 horses; and about 47,950 pigs. Tin exported in 1908 amounted to the value of \$2,000,000; silver to \$1,850,000, copper, \$2,725,000, and gold, \$1,460,000. The total value of the imports in 1908-09 was about \$16,437,800, and of the exports \$19,649,500. There are about 750 miles of railway line in the country. A line runs through the island from the capital to Launceston. Telegraph stations number 330, controlling 4,080 miles of wire (including a submarine cable 430 miles in length); and there are 1,850 miles of telephone wire. There are over 400 postoffices. Vessels communicating with Tasmania, according to last report, numbered 65 steamers and 230 sailing vessels.

Tawney, James A., American politician: b. Mount Pleasant Township, near Gettysburg, Pa., 3 Jan. 1835. At the age of 15 he entered his father's blacksmith shop as an apprentice, and later learned the trade of a machinist. In July 1877 he removed to Winona, Minn., where he followed his trade until 1 Jan. 1881, when he entered upon the study of the law in the office of Bentley & Vance. He was admitted to the bar 10 July 1882, and entered the law school of the University of Wisconsin in Sept. 1882, that being the only school he had attended since the age of 14. He established himself in practice in Winona; was elected to the State senate of Minnesota as a Democrat in 1890; and was elected a Democratic representative from the first district of Minnesota to the 53d, 54th, 55th, 56th, 57th, 58th, 59th, 60th, and 61st congresses, 1893-1911. In 1910 he was defeated for reelection to the 62d congress by Sidney Anderson.

TAX ASSESSMENTS—TEA

Tax Assessments, Automatic. A system followed in Cleveland for the purposes of valuing real property for taxation, named The Somers System from its author, who was once connected with the New York Board of Commissioners of Taxes. Under it, all the valuations are matters of relation. If property is worth \$1,000 in one place, it is worth a certain percentage of that elsewhere in the same locality. The relative values were obtained by the community, not the official tax board, and only fixed after a conflict of testimony. The first step taken was to map out rough block lines in the central part of the business district. What was the most valuable spot in Cleveland had next to be determined. This being suggested, a number of census takers were stationed on the various corners to count the men and women passing during certain hours as a means of confirming the judgment as to the most valuable spot. An examination was then made into the leases on the property, and sales; and then testimony of real estate men was taken. As a result, the highest point of value in Cleveland for land without improvements was fixed at \$5,500 a front foot of 100 feet deep. In a word, the suit chosen was one by 100. Under the unit system, the board determines unit values without any knowledge of lot lines, which are not printed on the maps used. This makes it practically impossible to favor one owner as against the other. Clerks secured from the Cass School of Applied Science, Western Reserve University, and elsewhere, appraised the individual lots by applying to them the unit in the centre of the block. Certain fixed rules and formulas were necessary for lots of irregular shape. A ratio was also adopted for lots less than or over 100 feet. For corner lots a ratio based upon the relative unit values for the front and side streets was evolved; instead of a fixed increase of 25 or 30 per cent. In addition, the board secured the unit value of buildings by having an architect prepare the schedule of cost of frame, brick, and brick and frame buildings. Blanks containing questions were then sent to the owners to fill in. They were made out for each property and, according to the type of the building, the superficial floor area was multiplied by a sum ranging from \$1 to \$40. The depreciation was deducted from this figure. Age, condition of repair, and character of the neighborhood were elements in it. This new method was the result of an act passed by the Legislature in 1909 providing for the quadrennial appraisal of real estate. It abolished the old system of district appraisals and provided that 5 officials be elected in every city to value the property within it. The law also required that notice be given to the owner, not alone of his appraisal, but also that of his neighbors'. Under the Ohio constitution, all property must be assessed at its full value in money. No county attempted to comply until the present tax officials were chosen in Cleveland. They employed Mr. Somers to do the work and gave him a chief engineer and architect as his assistants.

Taxidermy. The stuffing of animals and birds, which was formerly done in a haphazard way to make the work of the taxidermist as much as possible like the original, without particular effort in that direction, has given way

before a new school of taxidermists, who are capable artists and study the animal thoroughly, reassembling the skeleton and working from life sketches of the living animals. With the re-assembled skeleton before the workman, muscles made of clay are fitted to it until the semblance of the whole body is made and it resembles a skinned animal. This requires a knowledge of anatomy, and in order to make the skin fit perfectly, considerable patience and skill are required. The skin, however, is not fitted over the clay model, but a plaster of paris cast is taken from it, and this is altered in minor details until the skin fits without wrinkling. The two men who have developed this art in America are C. F. Akeley and James L. Clark. The latter modeled the Carnegie lion at the American Museum of Natural History in New York, believed to be one of the most perfect pieces of taxidermy ever attempted. A Virginia deer in the same museum was made by Akeley. The importance of this new art in preserving the correct form and attitudes has been recognized by museums, and there is a general movement among museum directors to have all its animals mounted in this manner.

Tax, Income. See INCOME TAX.

Tea. While tea, as a beverage, has been in use in oriental countries from the very earliest times, it is only within comparatively late years that it has been imported in large quantities into eastern countries, and more recently still that attempts have been made to grow tea on home soil. As late as 1880, the United States Government employed Mr. John Jackson to experiment, and see whether he could grow tea successfully in this country. He reported favorable results, and later some 200 acres, near Summerville, S. C., were given over for experimental purposes and the cultivation of tea. At the present time, about 100 acres in that district are given up to tea growing, and the yield is said to be about 12,000 pounds of dry tea each year.

Experiments were conducted during the summer of 1905, with a view to developing a simple process by which both the green and the black teas can be made successfully by any intelligent person with only such utensils as are found in every kitchen.

Tea requires a moist soil upon which to grow successfully. About 50 inches of rainfall annually are required,—about 30 inches of which must occur in the cropping season. The temperature must never fall to zero, and but seldom below 24°F. Under these conditions, the cultivation of tea may safely be risked.

Tea should be planted in the fall or early winter, just before a period of rain. The tender plants must be protected from the winds,—which is generally effected by a "wind-break," or by planting the shrubs against the side of a house. In the frame covering the tea-plant there must, however, be cracks about 1½ or 2 inches wide, sufficient to allow the admission of a few of the sun's rays. The soil must be pulverized and freed from grass and roots to a depth of some eight inches. The seeds are then placed in little holes about 1½ inches deep and four inches apart. The surface of the soil is then smoothed over with a rake.

During the winter months, the tea beds must be protected with a covering of straw; and

this is not removed until the plant begins to shoot above the ground. As the first shoots make their appearance, a little of the straw is removed; and it is taken away, little by little, until the whole of it is removed. Seedlings are transplanted, as a rule, in the fall or spring, after a heavy rain. The soil must be wet to a considerable depth when this is done. When the plants are grown, at the end of from one to two years, the processes of cultivation, pruning, plucking, curling, etc., take place. According to Mr. Mitchell, "the crop of an average tea bush is about 3 ounces of cured tea during picking season, so that 100 plants will yield about 18 pounds a year. As a pound makes from 350 to 400 cups of tea, 50 plants would furnish a cup of tea apiece to a family of nine for every day in the year."

As to the uses of tea, Dr. Wiley has lately published an article, in which he contends that the excessive use of tea and coffee (q.v.) should be prohibited; and that, next to alcohol, these beverages are the most dangerous and most to be feared. He says, in part. "Coffee and tea have become such universal beverages in the last 300 years as to present a problem which must be faced in some way. The problem is not so acute as in the case of alcoholic beverages, which are not natural products. . . . There are a great many persons who are keenly susceptible to the influence of some of the soluble substances contained in tea and coffee. Most active by far of these substances is caffeine. It has a peculiar effect in general, and in many cases has special effects. Many parents forbid the use of tea and coffee to their children, and I think this a wise precaution. The word 'prohibition' is perhaps a better word to use than 'temperance'."

Technological Chemistry. See CHEMISTRY, TECHNOLOGICAL

Telautomatics. During the year 1909 some important discoveries were made in the field of telautomatics, or the wireless control of automata, by John Hays Hammond, Jr. This young Yale graduate claims by a special mechanism to have attained absolute selectivity, thus doing away with the interference common to the ordinary wireless systems. This device, by using only one wave or impulse, will differentiate the impulse at the will of the operator up to more than 1,000 separate mechanical movements. In this fashion any ordinary mechanism will be capable of being controlled by wireless waves. Young Mr. Hammond has protected his discoveries with four different patents. These "monopulse" patents, as they are called, cover systems for the control of mines, torpedoes, dirigible balloons and railroad switches. The new machines have been thoroughly tested by the inventor and, if they live up to the records of their tests, they should prove of great scientific and practical value.

Telefunken. See WIRELESS TELEGRAPHY.

Telegraphy and Telephony. The recent improvements in both these sciences have been very extensive. Beginning with the simple Morse telegraph outfit, which is too well-known to need explanation, the advance was soon made of sending simultaneous messages over the same wire—two messages being sent at the same time over the wire without mutual interference. The next step followed logically from

this—four messages instead of two being sent along the wire. To insure this, the artificial lines must be, as far as possible, the electrical equivalents in resistance and electrostatic capacity of the actual lines, and means have been provided for varying these factors, as the actual line itself varies under the influence of weather changes. There is another method, based on other principles altogether, by means of which as many as 12 messages can be sent at the same time—in one direction. This is accomplished by a series of electrically-driven tuning-forks, and the receivers are so adjusted that they respond only to one frequency. There are several other systems of like nature, one invented by Delaney, for example; and the Wheatstone system, in which three rows of perforations are employed. This latter is employed very largely in Great Britain. It has certain disadvantages for public message traffic, however—the initial perforation, distribution among the telegraphers, etc.

The great drawback with all the systems just mentioned is that, while they increase the carrying capacity of the wires, they entail a good deal of delay at the receiver's end. Inventors have accordingly set about devising a variety of improvements to offset this drawback, with varying success. The most practicable, so far, is the Hughes type-printing instrument, which is used all over Europe to a large extent.

The Baudot system admits of the transmission of a much larger number of messages over each wire than the Hughes. It is also more flexible, inasmuch as the various channels it provides can be divided among an equal number of towns.

The Western Union Telegraph Company of America has introduced extensively a system known as the Barclay automatic type-printing apparatus. At the sending end the code of electrical signals adopted consists of long and short intervals, either marking or spacing, representing the various letters of the alphabet. Every letter is represented by six current alterations, but the receiving apparatus is so designed that, although every current acts on an escape wheel that makes a momentary contact with certain selecting relays, only those of long duration effect any movement in the latter. There are 32 printing magnets, which act as the keys of a typewriter, and cause the message to be printed direct on the receiving instrument.

In addition to these devices, various ingenious writing telegraphs have been devised; one especially, designed by Pollak and Virag, has attracted much attention by reason of its ingenuity. It is not largely employed, however.

Having now passed in rapid review the chief apparatus that is employed in sending telegraphic messages, let us now turn to the more strictly theoretical side of the question.

In long-distance messages, the great factor to be overcome is resistance, which degrades electrical energy into heat. In the case of overhead wires, which must yet be employed very largely in long-distance messages, they are usually of very low resistance, and this can be reduced to a minimum by using wires composed largely of copper, and by increasing the size of the conductor; their electrostatic capacity is small—say from 0.013 to 0.014 microfarad per mile—and their self-induction is relatively great.

When wires came to be laid underground,

TELEGRAPHY AND TELEPHONY — TELEVISION

many of the objections to which overhead wires were subjected were at once done away with. The great cost of the gutta-percha, however, which was used as insulator for the wire, was a serious drawback, and it was only when dry paper came to be used—as it now is in England, that miles and miles of underground wire could be laid at a minimum cost. This was used largely on telephone wires. There is thus considered to be a definite connection between this wrapping for the wires and the improvements in telephone service in England, and elsewhere. Sir John Gavey, in his "James Forest Lecture," delivered before the Institution of Civil Engineers, 22 June 1910, said:

"Submarine telegraphy is not susceptible of the many developments that have been possible with land lines. The high electrostatic capacity, varying from 0.3 to 0.4 microfarad per mile, and the very long lengths that are necessary to connect the great continents of the world, render the use of any but the most delicate apparatus impossible on long cables. The receiving instruments originally invented by the late Lord Kelvin,—then Sir William Thompson,—are still the only apparatus available for the reception of messages on the long transcontinental cables, and, so far, it has not been found possible materially to increase the speed of working, except, of course, by increasing the dimensions and cost proportionately.

"In telegraphy, when transmitting through an overhead line, the frequency of the current alternations is only about 180 per second for 450 words per minute, and the current has operated the apparatus at the further end, before the battery connection has ceased. Another condition, however, is introduced when a conductor is used for telephonic speech, in which a maximum frequency of 1,800 to 2,000 vibrations per second has to be dealt with. In these cases the transmission from the telephone assumes complex wave forms, and the effect of even a moderate capacity becomes far more marked than in the case of telegraphic transmission. If a simple wave-impulse were emitted in a circuit containing neither capacity nor inductance, it would maintain its form, and it would only lose its amplitude owing to the waste of energy in heating the conductor. With such capacity in the circuit, however, the wave tends to elongate, and if the capacity be sufficiently great, and the line sufficiently long, the following wave overtakes the lagging tail of the previous one; they blend more or less together, and, having lost their distinctive character, they fail to impress on the receiving telephone the distinct character of the sound from which they emanate. Of course, if this happens with a simple sine wave, this 'damping' action is intensified in the complicated wave-forms which speech assumes. Various vowel and consonant sounds obtained on an oscillograph show the wave as it enters and leaves. A standard telephone cable may vary up to 20 miles in length. The amplitude is greatly reduced, and some of the overtones cut off, although perfectly good and articulate speech is obtained under these conditions.

The rapid and enormous development of the telephone service that has taken place throughout the world within the past few years is a remarkable achievement of the electrical engineer. The principle of the microphone, which

converts sound vibrations into electrical vibration, and of the telephone, which re-converts the electrical into sound vibrations, is a fine example of the triumph of modern science.

Telegraphy, Wireless. SEE WIRELESS TELEGRAPHY AND TELEPHONY.

Telephony. See TELEGRAPHY AND TELEPHONY.

Telephony, Wireless. See WIRELESS TELEGRAPHY AND TELEPHONY.

Tele-Photography. For several years past experiments have been conducted in an attempt to transmit pictures by means of the telegraph, and although a certain amount of success has now been attained, the process is even yet far from complete or satisfactory; and no photographic reproduction has yet been transferred that has been considered in any way perfect. Considerable progress has, however, been made in this field, in spite of the great difficulties to be overcome. These difficulties are well pointed out by Mr Henry Sutton, in a recent article in the *Telegraphic Journal and Electrical Review*, London. He says

"The problem stands thus. A means has to be devised whereby the varying effects of a plane surface are transmitted in consecutive series of electrical currents, and by means of the consecutive series of currents reconstruct, so to speak, a copy of the original surface; that is, we have to take an optical image, seen as a surface, translate it into a line of consecutive varying electrical currents, and by means of these produce an effect as a surface, having the characteristics of the original image."

It will be seen that there are two images as surfaces having no time value, and a series of electrical currents having a time value, and yet these opposing characteristics are to be presented to the brain as a momentary impression. It will be seen that the problem appears all but insoluble; yet considerable success has now been attained in transmitting portraits, as we know. For the successful accomplishment of this, a transmitter and a receiver is necessary; and various makes have been suggested. As yet, however, no finality has been reached on this question; and perfection will have to wait on future progress and research.

Television. The commercial development of a device for seeing at a distance, that is, for reproducing instantaneously, or nearly so, optical images or distant objects. It was brought within the range of possibility during the year 1910. A practical system of television was worked out by Messrs Rignoux and Fournier. This is a development of Korn's device for electrically transmitting photographs, now in daily use between London and Paris. The latter is in itself a special case of television, the object "seen" being a photograph. Complete transmission occupies several minutes, but as the photograph does not move or change, this constitutes no drawback. Natural objects, however, are in continual motion, so that the transmission in that case must be practically instantaneous. It was to the solving of this problem that the French inventors set themselves.

Korn's photo-apparatus depends upon the ability of the element selenium to vary the strength of the electric current passing through it, in proportion to the brightness with which it is illuminated. In it a negative at one station

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produces a positive picture at the other by the successive transmission of many small parts.

Instead of prolonging this operation Rignoux and Fournier do it all at once. They have invented two types of apparatus, the first of which, designed only for demonstration, necessitates the employment of very many wires. It may be described briefly as follows. At the transmitting station some object, such as a large letter of the alphabet, is strongly illuminated and its image projected by a lens upon a frame containing a number of selenium cells, each of which is connected with the receiving station by a separate wire. Each cell, and its wire, transmits a current proportional to the brightness of the part of the image projected on that cell and the corresponding part of the object. At the receiving station these simultaneous currents of unequal intensity traverse an equal number of little coils, and thereby uncover the same number of little mirrors to an extent proportional to the strengths of the various currents. Beams of light reflected by these mirrors are projected on a screen, side by side, forming in patches of various degrees of brightness, proportional to that of the corresponding parts of the object. With a very large number of selenium cells, wires, coils and mirrors, it would be possible to transmit a picture with fine detail and many gradations of tone. The experimental demonstration made in this way, while rudimentary and crude, is at the same time convincing. The multiplicity of wires necessary to it constitutes a serious defect, but this the inventors believe they have obviated in their second apparatus, which is at present being perfected by them before being given a public trial. The properties of what is called "polarized light" are utilized at the receiving station in the second apparatus. A beam of light, after passage through certain crystals, becomes "polarized," and will not pass through a similar crystal unless the axis is held at precisely the proper angle. But if such a beam, passing through any one of certain transparent substances, is acted upon by an electro-magnet, the angle of polarization is altered, so that the crystal must be held in a different position to extinguish the light. These scientific facts have been applied most ingeniously by the inventors in their work on the second apparatus. It may also be found possible to diminish the number of mirrors and to operate each mirror successively by the currents from several cells. The inventors are now giving their attention to this phase of the matter; and, whether or not they are successful, MM. Rignoux and Fournier may congratulate themselves upon having at last solved the problem of vision at a distance by means of a single wire connecting the two stations. In the practical realization of the desired result the inventors will have to reckon with the phenomena of self-induction, interference, and the electric inertia of selenium. These, however, are more or less familiar technical difficulties which, sooner or later, will inevitably be surmounted. As soon as that is done television will become an every-day occurrence.

Temperance Legislation. The temperance movement in the United States, always to the fore among the more important national reforms, has been steadily gaining in strength and followers, and reached its highest point of operative efficiency in 1910. It has become a matter of more and more vital importance at

the polls, and has succeeded in causing the enactment of important legislation in its favor. The indications are that it will continue with ever-increasing scope. Having a modest start in this country in 1642, when the colony of Maryland passed a law making drunkenness a misdemeanor punishable by a fine of 100 pounds of tobacco, it has since made itself prominently felt in every State in the Union. Besides the support of all religious sects, the temperance movement has drawn to it some of the ablest minds in all walks of life. National and local temperance societies are very numerous, hundreds of thousands being enrolled among their members, a continual warfare against the liquor traffic, and all that accompanies it, is being waged, and, as a result, drunkenness and all crimes traceable to drunkenness are everywhere largely decreasing. Probably no movement in the country has made a unit of so many kinds and classes of humanity; certainly none is devoting itself to a more important work and needed reform, with such gratifying results to all those who have at heart the welfare of the body civic as a whole. The legislation which the adherents of temperance have succeeded in bringing about speaks eloquently for the progress of the work. It is as follows.

1906—Indiana increased the number of Moore law township remonstrances to 187, and abolished the liquor traffic in 17 city wards. Iowa placed a time limit bill on Mulct law saloons. Georgia extended the local option privilege to all counties, where dispensaries have been installed, while five counties joined those which had already gone "dry." The number of no-license counties in Arkansas was increased by 10, while the total majority recorded against license in that State was 15,618. Kentucky passed the County Unit Local Option law, which resulted immediately in 14 new counties passing into the no-license column, and the Governor at the same time ordered the closing of all Sunday saloons in Louisville. Two temperance laws were placed on the statute books of Louisiana. Thirty-two local temperance measures were passed by the Maryland legislature. Six of the 11 New Hampshire cities voted to go "dry." Assistant Attorney-General Trickett enforced the prohibition law in Kansas City, Kansas. Governor Cobb was reelected in Maine on a platform declaring strongly for the continuance of prohibition and prohibition law enforcement. The Jones residence district law, and the search and seizure law were passed overwhelmingly by the legislature of Ohio. Oklahoma showed a reduction of 128 saloons. One thousand law enforcement cases were prosecuted against liquor law violators in Pennsylvania. One county, three cities, and several small towns were won for no-license in California. Six additional municipalities voted dry in Virginia. The Sunday laws were enforced in Seattle, Tacoma, and other cities in the State of Washington. For army canteen substitutes Congress appropriated \$350,000 in addition to the sum already subscribed. The Oklahoma statehood bill was passed by Congress, requiring the prohibition of the liquor traffic in Indian Territory, and on Indian reservations for 21 years. This bill also provides that prohibition shall be maintained there until the people have changed the organic law. Congress prohibited liquor selling in all national soldiers' homes, and appropriated \$25,000 for the better

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enforcement of the laws against liquor selling to the Indians.

1907—Alabama passed a county option law, and later enacted State-wide prohibition. Jefferson County, Alabama, including the city of Birmingham, voted dry by a majority of 1,800. Arkansas abolished all saloons outside of incorporated towns. Colorado enacted a highly-successful local option law. Connecticut scored three new temperance laws. The legislature of Georgia also joined the ranks of those enjoying State-wide prohibition measures. A Sunday closing law was enacted by the legislature of Idaho. Local option in certain townships and cities was adopted by the legislature of Illinois. Of the 161 precincts voting in Illinois, 141 went "dry." The Delaware legislature submitted the liquor question to the vote of the people at large, with the result that every place outside of New Castle County and the City of Wilmington abolished the saloon. Of the 37 county options 35 went dry, at elections held in Kentucky. The Massachusetts legislature enacted the "Pony Express Law," aimed at the illicit selling of liquor in all dry territories. An anti-wine room law was passed by the legislature of Montana. Eight additional dry counties were secured in North Carolina. Ohio destroyed 350 "speak-easies," and 50 additional towns and cities in that State went dry. Several prohibitions were meanwhile added to the anti-liquor laws of Nebraska. Temperance victories were also reported in Missouri, Minnesota, and Vermont. Oklahoma adopted prohibition by an 18,000 majority. South Dakota passed a search and seizure law. An amendment to the Adams law of Tennessee resulted in the exclusion of the saloons from all but four counties in the whole State. In Virginia 11 of the 13 municipalities voting on the question went dry. A residence district local option law was passed in Wisconsin. Sixty-three additional townships and four counties were added to the no-license list of Indiana.

1908—The Georgia prohibition law went into effect 1 January. Illinois voted in a single day 1,053 townships dry, thereby abolishing more than 1,500 saloons. Wisconsin added 100 new communities to the no-license column, and abolished 400 saloons. Thirty-two additional towns in Minnesota were won over by the anti-saloon forces. In Nebraska 30 additional municipalities voted to go dry. Ten more counties in Michigan abolished saloons. In South Carolina 8 more counties were made dry. Governor Ansell was reelected in that state, chiefly because he ran on the anti-saloon platform. Mississippi came into line with a state-wide prohibition law, while North Carolina adopted state-wide prohibition by a majority of 44,000. Twenty-one of the 33 counties of Oregon voted to abolish the saloons under the county option law. Arkansas registered a total majority against licenses, in the county option elections, of 22,934, and elected an anti-saloon governor by an 80,000 majority. Leavenworth, Kan., the last liquor stronghold of that state, finally fell into line by abolishing the "joints." Governor Stubbs was elected in Kansas on a prohibition and law-enforcement issue. South Dakota drove the saloons from Mitchell, and several other important towns. Texas added 12 dry counties and reelected Governor Campbell on a straight anti-saloon issue. Three additional parishes in Louisiana voted dry. In Virginia

400 drinking places were closed. Rhode Island abolished 429 saloons, and passed a law limiting the licenses in that state to one in every 500 of the population, and prohibiting the saloon within 200 feet of a public or parochial school. Tennessee elected a legislature solidly pledged to enact state prohibition. Maine and North Dakota both elected governors pledged to the strict enforcement of prohibition. Two additional counties in California voted dry. The State of Washington elected a governor, lieutenant-governor, and the majority of the members of the legislature favorable to local option. Baltimore, Md., closed 393 saloons. One county in Maryland was made dry. Worcester, Mass., went dry for the second time. In the state of Massachusetts 215 saloons were outlawed through local option votes. In Iowa 461 saloons were abolished. In Indiana 720 saloons went out of business through remonstrance. The Indiana legislature, called in special session by Governor Hanley, passed a local option law. The Ohio legislature did likewise, while in four months 57 counties in Ohio voted dry. All this meant that throughout the United States 11,000 saloons were abolished, during this year, by prohibition and local option laws.

1909.—In Indiana and Ohio the effort of the liquor forces to repeal the anti-saloon legislation in those states signally failed. The Ohio legislature, on the other hand, enacted still more stringent temperance measures. With the first of the year, prohibition laws went into effect in Alabama, Mississippi, and North Carolina. Tennessee extended the four-mile law to all towns and cities, which meant practically state-wide prohibition, at the same time adopting another measure prohibiting the manufacture of liquor in the State. South Carolina adopted prohibition with a referendum by counties, and, as a result of the referendum vote, 36 of the 42 counties prohibited the sale of liquor. Prohibition bills passed both houses of the legislature of Arkansas, though the two houses failed to agree upon any one measure. The lower house of the Missouri legislature passed a resolution calling for a vote upon the prohibition amendment. Iowa passed anti-saloon laws in various ways limiting the liquor traffic. Maine and New Hampshire both wrote new restrictive law-enforcement measures on their statute books. Washington passed a municipal and rural county unit option law, whereupon more than 40 places in that State voted dry. Idaho enacted a straight county option measure, and 14 of the 23 counties abolished saloons. Arizona enacted a county option law. Wyoming abolished all saloons outside of incorporated towns. Kansas passed a particularly stringent measure prohibiting the sale of liquors for all except sacramental purposes. Nebraska limited the open saloon to the hours between 7 a. m. and 8 p. m. In Nebraska, Lincoln, together with two counties, went dry. Utah passed a county option law which was vetoed by the governor, but more than half of the counties of the State were so incensed at this action that they abolished the saloons by local decrees. Congress passed a C. O. D. liquor shipment measure for the protection of dry territory. Colorado added a number of towns to the no-license list, thereby making 11 counties dry. Four additional counties went for no-license in Illinois. In the fall election, 28 of the 36 places voting on the question in that State

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also went dry 19 more counties in Michigan abolished the saloon, while 12 in Texas adopted no-license. Three new counties were added to the no-license list in Kentucky, and two in Pennsylvania. The lower house of the West Virginia legislature passed an effective prohibition bill, while 8 additional counties in that State voted dry. In New York the elections resulted in a net gain of 88 towns to the anti-liquor forces. Sixty counties in Indiana voted dry. In Connecticut numerous anti-liquor measures were passed without opposition, while California added 6 counties to those already advocating no-license. Six temperance measures were passed by the legislature of South Dakota, while strong liquor law enforcement measures were passed by the legislatures of Georgia and Alabama.

1910.—Legislation in the interests of temperance continued to be passed during 1910. The Legislature of Texas passed a bill making the sale of liquors in no-license territory a felony punishable by from three to five years in the penitentiary. As a result of the decision of the United States Supreme Court saloons were prohibited on the Milwaukee railroad in South Dakota and other roads in the confines of the reservation. The Supreme Court of Wisconsin handed down a decision sustaining a lower court in refusing to sustain a demurrer to the complaint of a saloon keeper who had been voted out of business, who contended that he had a right of action on account of injury to his business. The city of Texarkana, Arkansas, under the provision of the three mile law, was made dry by the decision of the Supreme Court of the State. Conant, New Mexico, closed its saloons. Steuben county, Indiana, voted dry by a majority of 889 out of a total of 3,095. In April, of the 36 counties voting on the local option question in Michigan, twenty went dry, making a net increase of 10 counties for the temperance forces, and voting out of business 319 saloons and six breweries. The local option elections throughout Illinois resulted in a victory for the saloon forces in a number of important towns and cities, such as Rockford, Decatur, De Kalb, Dixon, Belvidere, etc. On the other hand, the city of Monmouth changed from wet to dry. In April the largest number of no-license elections ever held in the State took place in Wisconsin, resulting in a net gain of about 25 communities for the "dry" forces. Saloons in the same month were closed in the New Mexico cities of Endee, Tres Piedras, Shoemaker, etc. In May the number of saloons in Sault Ste. Marie, Michigan, was reduced from 74 to 21, and the number in Kalamazoo, Michigan, was reduced by 14. In June the Supreme Court of Washington handed down a decision holding the word "beverage" to mean any liquor of any kind, whether intoxicating or not, whenever such beverage is drunk merely for the pleasure of drinking or for its flavor. The same court sustained the law passed in 1909 prohibiting the sale of intoxicating liquors to Indians. Three Wisconsin towns were made permanently dry by the use of the remonstrance law. Two-thirds of the candidates nominated for the Legislature in Texas were pledged to the submission of a prohibitory amendment. The Republican and Democratic parties of Pennsylvania both nominated pro-liquor men for governor and lieutenant-governor; a Keystone party with a local option

plank was formed. In September the Supreme Court of Michigan handed down a decision declaring that a druggist who sold to a confirmed drinker was guilty, even though he sold the liquor on a prescription. By the order of the Interior Department of the Federal Government all the saloons in six counties of Minnesota were closed, and large sections of two other counties were made dry. Of the 49 cities and towns voting under the local option law in Washington, 28 went dry, including the two seaport cities of Bellingham and Everett, with a population of 35,000 and 30,000 respectively. As a result of a campaign in New Hampshire, eight cities and 23 towns voted for license and three cities and 201 towns voted against license. An effort to adopt a State-wide prohibition amendment to the constitution in Missouri was defeated by a majority of over 200,000. California elected a governor and a majority of the Legislature favorable to local option. As a result of the decisive vote for prohibition in Oklahoma, a campaign of law enforcement was inaugurated in the State, which resulted in the almost complete suppression of the liquor traffic. A systematic campaign for State-wide prohibition at the 1911 session of the Legislature was begun in Idaho. The license record of the city of Chicago showed 7,000 saloons to be in operation in that city. A campaign for State-wide prohibition was begun in Texas, the leaders of the different factions, among the prohibitionists of the Democratic party having united to bring about a saloonless State.

Temple, Edward Arthur, P. E. bishop b. King and Queen County, Virginia, 5 Sept. 1867. He was graduated at the Virginia Theological Seminary in 1895 and was ordered deacon in the Protestant Episcopal Church by Bishop Whittle in 1896. He was advanced to the priesthood the same year by Bishop Newton. He was first rector of St. Thomas' Church, Warren, Va.; of Meade Memorial Church, Front Royal, Virginia, and of St. Paul's Church, Waco, Texas. He was dean of the Northwest Convocation; member of the standing committee and of the diocesan board of missions of the diocese of Texas, at the time of the meeting of the General Convention at Cincinnati, Ohio, when the convention elected him bishop of the newly created missionary district of North Texas. He was consecrated in 1911.

Tener, John Kinley, American politician: b. Tyrone, Ireland, 25 July 1863. His father dying when John was only a few years old, he with nine brothers and sisters, was brought to America and settled in Pittsburg. His education was received in the public schools, and his early business connections were with large concerns at Chartiers, Pa. About 1890 he removed to Charleroi, Pa., where he engaged in banking and other financial enterprises. In 1898 he was elected to Congress and in 1910 was chosen governor of Pennsylvania with a plurality of 33,484.

Tennessee. A State belonging to the East South Central division of the United States, with an area of 42,050 square miles, of which 300 square miles is water. The population in 1910 was 2,184,789, being an increase of 164,173, or 8.1 per cent, in the past 10 years. The capital is Nashville; population, 114,234. The popula-

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tion per square mile is 52.4 Tennessee ranks 17th in population

Agriculture.—The acreage, production, and value of the principal farm crops of the State in 1910, according to figures of the United States Department of Agriculture, were as follows. Corn, acreage, 3,720,000 acres, yield per acre, 25.9 bushels, production, 96,348,000 bushels, total farm value, \$53,955,000. Winter wheat, acreage, 910,000 acres, yield per acre, 11.7 bushels, production, 10,647,000 bushels, total farm value, \$10,434,000. Oats, acreage, 200,000 acres, yield per acre, 23 bushels, production, 4,600,000 bushels, total farm value, \$2,116,000. Potatoes, acreage, 30,000 acres; yield per acre, 80 bushels, production, 2,400,000 bushels, total farm value, \$1,560,000. Rye and barley are also grown, the physical conditions permitting a great diversity of crops. Peanuts are grown in the Tennessee Valley. The cotton crop for 1909-10 amounted to 114,290,000 pounds, valued at \$4,156,000. Fruit trees and small fruits, notably strawberries, are cultivated. There are important forest products from about 27,300 square miles of woodland. Stock raising in the State is falling off. In 1910 the farm animals consisted of 324,000 horses, 290 mules, 321,000 milch cows, 565,000 other cattle, 347,000 sheep, and 1,264,000 swine.

Mining and Manufactures.—The coal-fields of Tennessee have an area of about 4,400 square miles. The coal output was 6,199,171 short tons, valued at \$7,118,490. Petroleum also is obtained. Pig-iron was produced, in 1908, to the amount of 290,826 long tons, value, \$4,011,000. Copper was produced to the amount of 19,710,103 pounds, value, \$2,601,734. The zinc output was 341 short tons, value, \$32,054. Other products were, barytes, 8,618 short tons, value, \$12,313; phosphate rock, 455,431 long tons, value, \$1,877,221; sandstone, marble and limestone, to the value of \$1,310,651. Clay products amounted to \$1,236,434. Including the value of pig-iron, and of some products from coal, but not iron-ore, the mineral output of the State amounted to \$19,277,031. The manufacturing industries include iron and steel working, but are mainly concerned with agricultural products. Flour milling, lumbering, the manufacture of cotton-seed oil and cake, and preparation of leather and of tobacco, are progressing. There are also textile manufactures. The last available figures give 3,175 manufacturing establishments, with a total capital of \$102,439,481, employing 4,910 salaried officials and 60,572 wage earners. The salaries paid in a year amounted to \$5,080,429, and the wages to \$22,805,628; the cost of materials used amounted to \$79,351,746, and the value of the output was estimated at \$137,960,476. The output of the flour and grist mills was valued at \$25,350,758; lumber and timber products, \$21,580,130; foundry and machine shop products, \$6,946,567; textiles, \$6,895,203. The Mississippi and Tennessee rivers are natural waterways, and the State contains 3,761 miles of steam railroad, besides 352 miles of electric railroad.

Government.—The present Governor is Benjamin W. Hooper; salary, 7,500. The Secretary of State is H. W. Goodloe; Treasurer, R. E. Folk; Commissioner of Agriculture, John Thompson; Superintendent of Public Instruction, R. E. Jones; Comptroller, Frank Dibrell; Adjutant-General, Turley Brown; Attorney-

General, Charles T. Gates, Commissioner of Insurance, R. E. Folk; all Democrats except Hooper. The General Assembly consists of a Senate of 33 members, elected for two years, and the House of Representatives of 98, elected also for two years. All male citizens who have resided in the State 12 months and in the county six months next before the election, and have paid the poll-tax (with the usual exceptions), are qualified as electors. Tennessee is represented in Congress by two senators and 10 representatives.

Finance.—The bonded debt and assessed valuation of Tennessee are as follows. Realty property, \$382,045,139, personal property, \$76,594,597, assessed valuation, \$458,639,736. The revenue and expenditures for the year ending in Jan 1910 were: Balance, \$1,132,900, receipts, \$3,539,666; total, \$4,672,566. Disbursements, \$4,441,909, balance, \$230,657. The bonded debt (including old bonds unfunded) on 20 Dec. 1909 amounted to \$12,000,000.

Religion and Education.—About 40 per cent of the church membership in the State is Baptist and 33 per cent Methodist, Presbyterians and Disciples of Christ rank next, and then Catholics. In several counties school attendance is compulsory, and throughout the State the employment of children under 14 years of age in workshops, factories or mines is illegal. There are separate schools for white and for colored children. The public elementary schools have 501,320 enrolled pupils, with 10,021 teachers. The public high schools have 346 teachers and 7,896 pupils. There is in the State a public normal school with 31 teachers and 503 pupils, besides two private normal schools with 19 teachers and 247 pupils. Higher education is provided in 22 universities and colleges, the more important of which are: The University of Chattanooga, 632 students; University of Tennessee at Knoxville (State), 694 students; Fisk University at Nashville, 1,005 students; Carson and Newman College, Jefferson, 582 students; Christian Brothers' College, Memphis, 310 students; Cumberland University, 251 students; University of the South, Sewanee, 553 students. There are also seven colleges for women, eight commercial schools, a manual training school within the State, and two colleges for colored students.

Charities and Corrections.—Within the State there are (exclusive of almshouses and establishments for imbeciles, etc.), 49 benevolent institutions, comprising 13 hospitals, 1 dispensary, 18 orphanages, 14 homes for adults and children, an institution for the deaf, and another for the blind. Of these institutions 36 have been provided by private or ecclesiastical charity. County Commissioners of the poor have supervision of the county poor asylum and farm, admission to which must be preceded by 12 months' residence in the county. The county court may let out the support of the poor with use of the asylum for three years, or contract for the support of the poor for a year, or make an annual allowance to the indigent.

Legislation.—No regular legislative session was held in the State during 1910. In 1909 the Legislature enacted a number of laws, the effect of which is State-wide prohibition, established a board of commissioners on uniformity of legislation, provided for primary nominations for all offices except those of judges and

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attorney-generals, regulated embalmers, created a library commission, passed a general educational bill and appropriated to its purposes 25 per cent of the gross revenues of the State, regulated the sale of agricultural seeds, provided against the spread of disease among cattle, regulated fire insurance, punished false statements on packages of merchandise as to weight or measure, and provided that persons shall not be disqualified as jurors because of opinions based on newspaper reports or rumors.

Terry, Ellen. English actress b Coventry, Warwickshire, England, 27 Feb 1848. Her parents were both actors. Her first appearance on the stage, at the age of eight, was as the boy Manlius in Mrs Charles Kean's revival of 'The Winter's Tale' in the Princess Theatre, London. A little later she won high praise as the young Prince Arthur in 'King John'. During the periods of 1860-63 and 1867-68 she acted with various stock companies, first appearing with Henry Irving in 1867, as Katherine to his Petruchio in the 'Taming of the Shrew.' It was during this period that her very early marriage to G. F. Watts, the painter, was dissolved and she contracted a new marriage with E. A. Wardell, an actor, in 1864. From 1868 to 1874 she retired from the stage, but reappeared in the latter year under Charles Keane's management, and, in 1875, joined the Bancrofts, winning her great success as Portia in a revival of 'The Merchant of Venice,' at the old Prince of Wales Theatre. Early in 1878 she made a great hit in the title rôle of W. G. Will's play, 'Olivia,' at the Court Theatre. As a direct result of this success, Henry Irving made her his leading lady, near the end of the same year, and the long artistic partnership at the Lyceum Theatre was commenced, she playing Ophelia to his Hamlet. Since this date, 30 Dec. 1878, her leading place among English actresses has been held unshaken. Others of her notable impersonations and rôles have been Portia, Desdemona, Juliet, Beatrice, Lady Macbeth, Cordelia, Viola, Marguerite in Will's 'Faust,' the Queen in Will's 'Charles I,' Pauline in 'The Lady of Lyons,' Fair Rosamund in Tennyson's 'Becket,' Madame Sans-Gêne in Sardou's play, and Clarisse in 'Robespierre.' Her first visit to America with Irving was in 1883, when she won immediate and unqualified favor; and her welcome to the American stage has been many times repeated. In June 1906, a jubilee performance, held in her honor at the Drury Lane Theatre, London, was one of the events of that season. In 1907 she married James Carew, and in the same year again visited the United States with a company of her own. In 1910, her ninth American tour, on which she gave many lectures and readings, was notable for evidences of appreciation and affection, chief among which were poems and resolutions prepared by a committee of welcome, of which President Taft was the head. Early in 1911, she was presented with a gold medal, the second ever struck off, by the founders of the New Theatre, in the presence of one of the most notable gatherings of distinguished people ever assembled in America.

Texas. A State of the West South Central Division of the United States, with an area of 265,896 square miles of which 3,498 square miles are water. The capital is Austin

with a population of 29,860. The population of Texas, according to the last Census, is 3,896,542, a gain of 27.8 per cent in ten years. The population per square mile is 14.8. Texas ranks 5th in population.

Agriculture.—Texas is one of the most important agricultural States of the Union. The acreage, production, and value of important farm crops in 1910 were as follows: Corn acreage, 8,800,000; production, 181,280,000 bushels; value, \$114,206,000. Winter wheat, acreage 1,252,000; production, 18,780,000 bushels; value, \$18,404,000. Oats, 695,000; production, 24,325,000 bushels, value, \$11,433,000. Barley acreage 5,000; production, 150,000 bushels; value, \$135,000. Rye, acreage 4,000; production, 46,000 bushels; value, \$47,000. Potatoes, acreage 60,000; production, 3,060,000 bushels; value, \$3,366,000. Hay, acreage 618,000; production, 711,000 tons; value, \$8,532,000. Tobacco, acreage 700; production, 420,000 lbs; value, \$105,000. Texas had, at the last census, 125,807,017 acres of farmland, of which 19,576,076 acres were improved land. In the arid region of Texas and New Mexico an area of 160,000 acres is to be reclaimed under the Federal Reclamation Act. The yield of cotton in 1909-10 amounted to 1,232,058,000 pounds or 2,570,000 bales. Other products are cane-sugar, sorghum, vegetables and fruits.

Mining and Manufactures.—The coal mines in Texas in 1909 yielded 1,985,377 short tons, valued at \$3,941,841. The production of petroleum was, in 1909, 9,534,467 barrels (of 42 gallons), valued at \$6,793,050. Quicksilver was produced to the amount of 2,382 flasks of 75 pounds, valued at \$122,260. Other minerals worked were salt (442,571 barrels, valued at \$255,652), cement, gypsum, granite, sandstone and limestone. The value of clay products (chiefly bricks) amounted to \$2,066,735. The following are the chief industries with their capital: Flour and grist, \$7,785,339; cotton seed oil and cake, \$14,179,688, lumber and timber, \$18,426,242; slaughtering and packing, \$6,374,743; railway cars, etc., \$4,598,912; petroleum refining, \$11,378,496; foundry and machine work, \$4,793,998; rice cleaning, etc., \$2,138,723; brewing, \$5,150,308, saddlery, etc., \$1,986,407. Other important industries are printing and publishing, bakery and confectionery, planing-mill work, cotton manufactures, copper-work, ice manufacture, sugar and molasses, and lead smelting and refining.

Fisheries.—The State has excellent oyster and other fisheries. The statistics follow: number of persons employed, 1,780; number of vessels, 157; value of vessels including outfit, \$269,337; number of boats, 991; value of boats, \$117,400; value of apparatus of capture, \$41,250; value of accessory property and cash capital, \$26,344; value of products, \$445,889.

Government.—The governor of the State is O. B. Colquitt, with a salary of \$4,000. The lieutenant-governor is A. B. Davidson; Treasurer, Sam Sparks; Comptroller, W. P. Lane; Superintendent of Public Instruction, F. M. Bralley; Land Commissioner, J. T. Robinson; Attorney-General, J. P. Lightfoot; Commissioner of Agriculture, E. R. Kone; Commissioner of Insurance, F. C. von Rosenberg—all Democrats.

Finance.—The total deposits in the State banks on 1 Jan. 1910, amounted to over \$51,000,000. The bonded debt of Texas is



O B COLQUITT
GOVERNOR OF TEXAS

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\$3,977,500. The assessed valuations are as follows: realty property, \$1,479,675,501; personal property, \$830,128,125; total assessed valuation, \$2,309,803,626. Receipts and disbursements of the General Fund in the year ending 31 Aug 1909 (the last available) were: Balance, 1 Sept 1910, \$1,424,641; receipts, \$8,053,491; disbursements by the comptroller, \$4,304,607; by transfer to the school fund, \$4,017,776.

Religion and Education—The largest religious bodies are the Baptist and Methodist, other important denominations being the Catholics, Disciples of Christ, Presbyterians and Episcopalians. The employment of illiterate children under 14 years of age in factories, etc., is illegal. Separate schools are provided for white and colored children. In 1910 the public elementary schools had 20,098 teachers and 968,269 enrolled pupils. The State has three public normal schools, with 60 teachers and about 2,000 students. For superior instruction there are numerous institutions, the chief of them being: St. Edward's College, Austin; University of Texas, Austin; Howard Payne College; the Agricultural and Mechanical College; Fort Worth University; Baylor University, Waco; and Wiley University, Marshall (Colored). The Prairie View State College (Normal and Industrial) for colored youths had 22 professors and 471 students in 1908.

Charities and Corrections—Apart from almshouses and establishments for the insane, there are within the State 76 benevolent institutions, 14 of which are public, the rest being provided for by private charity and by religious bodies.

Legislation—No regular legislative session was held in Texas, but a special session was called in July, 1910. The State in 1909 made various provisions for educational purposes. It established a library commission and provided for instruction in manual training, domestic science and agriculture. It created a board of public health, authorized the establishment of a home for lepers, enacted pure food laws, regulated the practice of nursing and provided for the inspection of plumbing. It provided for prospecting its mineral resources, for agricultural experiment stations and for the protection of plants, shrubs and trees against disease. There were a number of laws passed regulating railroad operation, among them one prohibiting more than sixteen hours of consecutive service in the operation of trains. Blacklisting was also forbidden. At the special session, an effort was made to enact more radical anti-saloon laws which would have had the effect of practically prohibiting the sale of liquor in the State. Several of these bills passed the House but were defeated in the Senate by the narrow margin of 16 to 14. At this session an act was passed providing for the remodeling of the penitentiary system of the State and a State Insurance Board was created.

History.—The elections of 1910 resulted in the election of the Democratic candidate, O. B. Colquitt, as governor with a plurality of 147,886. The vote cast for the Republican candidate, J. O. Terrell, was 26,107. There was a movement among the people of Western Texas for a division of the State into two States, the people of Western Texas assert-

ing that they did not receive proper consideration at the hands of the Legislature, the members of which were mainly from the more populous sections. New Mexico, moreover, demanded that the western boundary line of Texas be moved back two miles to the one hundred and third meridian, entailing a loss of several towns and about 128,000 acres of land which had been considered a part of Texas since Congress ratified the Clark survey made in 1860. The whole question hinges on whether the ratification of the survey made by Clark for the Federal Congress legalizes the present boundary. As a result of the conviction and life sentence of Sergeant Manley, who bayoneted and killed a spectator during President Taft's visit to Dallas in 1909, three line officers and four company officers of the National Guard resigned and three companies asked the Governor to muster them out.

Tibet. A Chinese dependency on the northern frontier of India, situated between Kashmir and Burma. The area is estimated at 463,200 square miles and the population at 6,500,000. A political movement was directed against Tibet from India in 1904, owing to a disregard on the part of the Tibetans of a trade convention of 1890. In September of that year a new convention was signed, providing for the erection of boundary pillars between Sikkim and Tibet, and for markets, and for unrestricted trade. In 1906 the convention of Peking was signed, China accepting the conventions of 1890 and 1904, and declaring that no foreign power should interfere in Tibetan affairs. The following year (1907) England and Russia recognized the superior rights of China in the territory, and agreed to take no political liberties. Under the sovereignty of China the territory has been quite satisfactorily administered and trade has flourished, but the native "monks" have given trouble to China, and that country has made continual expeditions against Tibet, finally succeeding in banishing the Dalai Lama to India, where the British Government refused to abet his actions, but grants him an asylum at Darjeeling. Britain has direct commercial arrangements with Tibetan authorities, according to agreement, and her Indian territory receives a large amount of the exportations, including wool, borax, salt, live animals, musk, etc. On the other hand, Tibet receives from India such articles as woolen and cotton goods, coral, and grain. The total value of the trade in 1909-10 was about \$100,000.

For a number of years following 1904 the Government of Tibet has been in a remarkable condition where the real head has been deposed and, moving a few hundred miles, established himself anew and ruled the country in spite of the action of the Chinese Government, which to placate the English Government chose another man in his place. This was, however, a purely diplomatic move, as the Dalai Lama, after his flight from Lhasa upon the arrival of the British troops in 1904, was never actually succeeded by Tashi Lama, who was appointed in his place. Dalai Lama with his whole court proceeded north across the plain of Mongolia and established himself at Urga, where he arrived 29 November and was met by 20,000 citizens. It was arranged in the winter of 1910 that Dalai Lama was to visit the Emperor of China in Peking.

TILDEN STATUE—TOADS

In deposing Dalai Lama for not remaining to guard his kingdom, the Emperor of China was unquestionably aware of the fact that his action would have absolutely no effect, and that Dalai Lama would remain all-powerful on account of the fact that he is the supreme temporal and spiritual power of the Buddhist faith. During the four years preceding 1910, the Grand Lama of Lhasa, as he was still called, although no longer resident in Lhasa, was visited by hundreds of thousands of pilgrims from all parts of Tibet, Mongolia, Kashmir and Siberia. He continued to remain the most powerful personage in all Asia as the spiritual head of 600,000,000 people. Dalai Lama had no intention of attempting to usurp his authority, taking the political authority only and assuming none of the pomp which surrounds the Grand Lama. A photograph of Dalai Lama was secured during 1910. Previously he had been seen by but one white man, but he made no objection and sat for the photograph when he was approached at Phari-jong. When he posed for the photograph he had been in India as far as Calcutta. Above his head was the inscription, the motto of his office, expressed characteristically "A jewel, in the flower of the lotus"

Tilden Statue. The members of the Municipal Art Commission have disapproved of the memorial to Samuel J. Tilden which the Tilden Memorial Committee planned to present to New York. The following is the resolution by the commission: "Resolved, that the art commission hereby disapproves of the design and location of the Tilden monument on the west side of Madison Square." The architects of the design are Wilder and White, and the sculptor of the figure of the great Democratic leader is William Ordway Partridge. The reason given for the commissioners' rejection of the statue is that there are already three monuments in close proximity in Madison Square—William H. Seward at the southwest corner, Roscoe Conkling at the southeast corner—and the General Worth monument opposite the park.

Timber. See LUMBER.

Timor. An island in the Malay Peninsula, belonging to Portugal and Holland. The island of Pulo Cambing and the territory of Ambeno are included in Timor. The island was divided between Portugal and Holland in 1859, and a boundary was established in 1904 and 1908. The area of the Timor Archipelago is about 17,700 square miles, and the population (last estimate) about 308,600. The administration has, since 1896, been conducted independently of Macao. The revenue amounted in 1909-10 to about \$153,800, and the expenditure to \$242,600. The principal products of the country are coffee, sandal wood, wax and sandal-root. In ports in 1908 amounted to the value of \$341,600, and the exports to the value of about \$394,200. The respective values of the various articles of export were: coffee, \$253,750; sandal wood, \$51,550; wax, \$26,150; and sandal-root, \$20,350. Nearly 400 vessels entered the port of Dilly in 1908.

Tin. See METALS.

Tiny Town. Considerable popular interest was attracted during the year 1910 by a collection of abnormally small persons who were

gathered together at a London theatre under the name of "Tiny Town." Although the primary object in bringing these little people together was, of course, to make money, a distinct value also attached to their community from a pathological and anthropological point of view. By far the majority of these Tiny Town dwarfs belonged to that kind of dwarfishness which arises sporadically, without evident cause, and has been termed "ateleiosis." It is characterized by the perpetuation of the physiognomy and bodily proportions of the particular time of life at which it happens to begin. It is also distinguished by the frequent occurrence of heredity and by a strong and well defined family likeness. These characters are well illustrated among the dwarfs of Tiny Town, most of whom were evidently little more than stereotyped children, and therefore bore extraordinary resemblance to one another. They had shrill or piping voices, large heads, short, flat faces, with noses inclined to be uptilting, and short limbs. Of particular interest among this group of dwarfs was the wife of the late Tom Thumb, who attained so much prominence when being exhibited by Barnum's circus. Mrs. Thumb was the mother of a dwarf child, which unfortunately died. Physicians in general were greatly disappointed at this from a scientific standpoint, since Mrs. Thumb had proved the possibility of producing a new species or variety of humanity, which would have been an interesting object of study.

Many of the Tiny Town dwarfs were really delightful persons, aside from their diminutive size. Two of them were obviously cretinoid, but their intelligence, although decidedly slow, seemed to be too good for the subjects of life long primary cretinism. On the other hand, one dark-skinned inmate of the Tiny Town community apparently owed his small stature to a totally different cause. His head was very small, his nose prominent, and his chin weak. Altogether, besides giving their regular entertainments, the little folk of Tiny Town proved of great interest to all those who make a study of post-natal development, normal or abnormal.

Toads. The toad, although long held in disrepute because of numerous groundless superstitions hanging over him (as, for instance, that the act of picking up a toad will produce warts on the hand), is in point of fact a very great friend to the farmer. He renders conspicuous service to all agriculturalists, but particularly to gardeners and greenhouse owners. This is because of the number of pestivorous insects which he devours within a comparatively brief space. Among the particularly injurious insects which form his daily food are to be numbered cutworms, army worms, caterpillars, cucumber and potato beetles, snails, thousand-legged worms and sow bugs. The quantity of injurious species destroyed by the toad forms 62 per cent of his total diet. Should ants be considered as injurious, as many housekeepers would deem proper, this figure would be increased to 81 per cent. Among the beneficial insects destroyed by the toad are many kinds of ground beetles, a few spiders, an occasional carrion beetle, ladybird and ichneumon fly, but as these form only 11 per cent of his food, it becomes easily apparent that it will pay the farmer to protect the toad and keep as many as possible on his land. A toad, as a

rule feeds continuously throughout the night, consuming in twenty-four hours an amount of food equal in bulk to about four times the stomach capacity. The remarkable amount of food which toads consume was evidenced recently by investigations which showed 77 thousand-legged worms in the stomach of one toad, 37 caterpillars in another, 65 gypsy moth caterpillars in a third, and 55 army worms in a fourth. It has been estimated that a single toad will destroy in a year insects which, had they been permitted to live, would have damaged crops to the extent of about \$20.

The toad possesses a strong homing instinct, often inhabiting the same locality or garden all his life. This makes it difficult to establish toad colonies unless the animals are brought from considerable distances, for, if left anywhere in the vicinity of his usual haunts, a toad will speedily return to them. It is said that English gardeners, fully realizing the value of the toad to them, often pay as high as \$25 per hundred for toads for colonizing purposes. Such experiments often prove successful, but they are by no means certain. A better plan is to provide a breeding place for toads and carry them to it at mating time. When this system is adopted, it is advisable to provide artificial shelters for the animals in the gardens

Tobago. See TRINIDAD.

Tolstoy, Count Leo, Lyof (English Leo) *Alekseevich Nikolavitch*, Russian novelist and socialist: b. on the family estate of Iasnaya Poliana in the Government of Tula, south of Moscow, Russia, 9 Sept (new style) 1828; d. at the railroad flag station at Astapor, 20 Nov. 1910. He had left home surreptitiously, intent on reaching the Caucasus, where in a Tolstoinian Colony, on the shores of the Black Sea, he had hoped to end his days away from the eyes of man. After spending a week of quiet farewell with his sister Marie, a nun in the ancient cloister of Shamardino, in the province of Kaluga, he learned through his daughter Alexandria, who had found his whereabouts and had come to meet him, that his purpose had been discovered, he decided to go at once. Broken down by the hardships of a winter journey, mental strain and the rupture with his family, his companion, and physician, Doctor Makovelsky, realizing that a continuance of the journey would be fatal, they left the unventilated, third-class compartment, crowded with peasants, at the flag station at Astapor, barely 80 miles from the home he had left a few days before, and in a rude hut, the best they could provide, his daughter, Alexandria, acted as nurse. On 16 November the Countess, hearing of their whereabouts, demanded to be allowed to leave her sick bed and join her husband, even after an unsuccessful attempt at suicide. With her own physician, her two sons and a friend, Mrs Tchertkoff, she journeyed to Astapor, where, surrounded by the members of his family, Count Tolstoy expired from the weakening effects of repeated attacks of heart failure. In the last attack, he was alone with his eldest daughter, when he clutched her hand and drew her to him, able to speak only in a choking whisper, "Now the end has come. That is all." The attending physician hearing the anxious calls for help from the affrighted daughter, came to the bedside and Tolstoy

raised his head, drew himself up to a sitting position, and when he had received his broth, said, "There are millions of people and many sufferers in this world, why always anxious about me?"

Tolstoy was a descendant of an aristocratic family of Teutonic origin whose earliest known member of prominence, Count Peter Tolstoy (1645-1729), was a trusted friend and political agent of Peter the Great. Tolstoy the younger was left an orphan at an early age, attended the University of Kazan, 1843-46, and, with his brother Dimitro, joined the army and served in the Caucasus and in the defense of Sebastopol during the Crimean War. He returned to civil life after the war and resided at St. Petersburg and Moscow, finally retiring to his country seat and devoting himself to literary pursuits and religious teachings. His early publication, 'Childhood, Adolescence and Youth' (1853), gave him considerable reputation in Russia, but it was not until the publication of 'War and Peace' (1860) that his writing attracted much notice from other countries. This he followed with 'The Cossacks,' a description of life in Caucasus, and 'Anna Karenina' (1876) which has been extensively dramatized, and which is generally acknowledged as his most supreme attainment in fiction; and later with 'The Kreutzer Sonata' (1880). He was an interested witness of the actual events as well as the political effect of the Crimean War, which changed the position of Russia in the family of world powers; the emancipation of the serfs with its effects on the social structure of Russia; the war with Turkey in 1878, followed by the humiliation of the Congress of Berlin; the awakening of Russian industry and the expansion of Russian civilization to the Japan Sea, which brought Russia into collision with Japan, followed by the political revolution and the Duma—all these events greatly exciting the sensational and dynamic mind of Tolstoy and were reflected in his writings. His authorship was of the abnormal type, due probably to his lack of education and literary training and partly to the confusing conditions of national and international subjects with which he dealt. He did not consider himself a man of letters and cared not for literary honors. His purposes and point of view were constantly changing, while his sincerity was never doubted as he passed from one thing to another in the search for a social panacea. The literary critics of Russia and France regard his fame as resting on his 'War and Peace' and 'Anna Karenina'; the first, a vivid picture of Russia during the invasion of Napoleon, and the other smaller and more compact canvas, reflecting the condition of the upper class of society, the Russia of modern times. There is no question of the influence these books exerted on contemporaneous thought and but little as to their permanency, notwithstanding the fact that the author, in his last years, condemned both works and would have burned them if he could thus have destroyed their influence.

He thereafter devoted himself to polemical, philosophical and ethical writings, his teachings on these subjects being treated so broadly and fearlessly that many of them were forbidden circulation in Russia by the governmental censors. His theories were, non-resistance to evil; communism; the duty of manual labor;

TOMATOES—TORPEDO

and the simple peasant life for all men. Prominent among his works in this field are: 'My Religion' (1885); 'My Memoirs' (1887); 'What to Do' (1887); 'The Kingdom of God Within Us' (1895); and 'The Four Gospels Harmonized and Translated' (1895). Among his other works are: 'My Confession'; 'Criticism on Dogmatical Christianity'; 'What I Believe'; 'What is to Be Done'; 'The Death of Ivan Ilytch'; 'The Power of Darkness'; (a drama); 'On Life'; 'The Fruits of Enlightenment' (a comedy); 'What is Art'; 'The Christian Teaching'; 'The Resurrection'; 'The Slavery of Our Times'; and 'Three Days in a Village' (1910). The last was an appalling narrative of present-day life and death among the Russian country people, and was censured and ordered seized by the Russian Government. Throughout his life he devoted himself to the bettering of the condition of the Russian peasant, by whom he was greatly loved, and was quoted as the "one man in Russia who dares to speak his mind," and "the peasants' friend."

In his 'Four Gospels,' translation of which was forbidden in Russia and which he was obliged to have printed in Geneva, he repudiated the authority of the Gospels as records of the life of Jesus. He considered the story of the virgin birth, the resurrection, and the miracles as no essential part of Christian doctrine, and he expressed a contemptuous estimate of the Apostle Paul. He married in 1861 the young daughter of a prosperous physician in Moscow. She was a school girl at the time of the marriage and during the first 20 years of her married life she employed herself in building up the bankrupt estate of the indifferent young nobleman. She exercised her superior business sense, and enlisted the assistance of their children in paying off the mortgages, and about 1885 the Count, Countess, and their 17 children were enabled to transfer the entire household from the humble tenement or peasant's hut, as the Count loved to call it, and take their proper place as master and mistress of the Ancestral Tolstoy mansion. It is worthy of mention that neither the Countess nor her children ever adopted, save in the case of one of their daughters, and she only for a time, the views on religion and philosophy taught and expanded by the Count.

Tomatoes. The most important development of recent years in the tomato industry has been the evolution of a seedless tomato. The ordinary tomato contains many hundreds of seeds, but Professor Halsted, of the New Jersey Agricultural Experiment Station, has succeeded in developing a form which seldom contains more than 50 seeds, frequently not more than five or six, and in many instances is absolutely seedless. This variety has become very well established now, being known as the "Giant" because of the very large size to which the plant grows. Professor Halsted produced his specimens by judicious selection and crossing, while E. P. Sandsten, working at the Wisconsin Experiment Station, obtained the same results by the use of excessive amounts of fertilizers. Of the ordinary seed tomato there are at present a number of distinct types under cultivation, the most important being the Currant type, the Cherry type, and the common commercial type, of which there are

many varieties. These are grown extensively both in the North and South, both for raw consumption and for canning. The tomato is one of the few garden vegetables of American origin holding high rank as a commercial crop which has come into cultivation within the last century. Although a most popular vegetable, the tomato is able to supply the large demand for it and, wherever grown, proves a most remunerative crop to the producer.

Tomatoes, Seedless. See TOMATOES.

Tonga Islands. Also known by the name "Friendly Islands", lying in the southern Pacific ocean, southeast of Fiji Islands about 400 miles. The area of the Tonga group is about 385 square miles, and the population 21,750. Of this number, 21,100 were natives of Tonga, 300 natives of other islands, 90 foreigners; 150 British; and 120 half-breeds. The chief town and seat of government is Tongatabu. There is a king in the land, Jioaji Tubou II by name, although the islands are under British control. The revenue for 1909 was about \$200,000 and the expenditure \$170,000. There is considerable over-sea trade carried on, shipping in 1909 registering 65,000 tons cleared, all but 4,000 tons of which were British. The imports into the Friendly Islands in 1909 amounted to the value of about \$1,260,000, and the exports abroad to the value of about \$1,085,000.

Tonking. French territory in Asia, adjacent to Annam, with an area of about 46,400 square miles, divided into 14 provinces, with 8,000 villages. Population, about 10,000,000. A Resident at Hanoi (population about 150,000) administers the government. Hanoi is now the capital of Indo-China also. There are about 400,000 Roman Catholics in Tonking. Europeans number 3,900. Education is promulgated in 38 schools, and there is a school of medicine for natives at the capital. Rice is the principal product of agriculture. Other crops are cotton, cardamoms, coffee, tobacco and fruit. Sugar, pepper and oils are produced. Animal products are among the territorial resources. The annual production of raw silk amounts to over 10,500,000 pounds. Among the manufacturing industries, there are a cotton mill at Haiphong, with 25,000 spindles; and another at Hanoi, with 10,000 spindles. The imports into Tonking comprise metals and metal tools and machinery, yarn, tissues, beverages, etc. The leading articles of export are rice and animal products. The imports for consumption amounted, at last returns, to over \$11,580,000, and the exports (domestic) to about \$11,686,250. Haiphong is the most important port in the country, and is visited regularly by two French companies' steamers. More than 200 vessels entered at that port in a recent year. There is an insignificant trade communication between Lungchau and Hanoi, and the latter and Mengtze.

Tornadoes. See CYCLONES AND TORNADOES.

Torpedo, Wireless. Since wireless telegraphy was first proved to be a scientific possibility, there have been numberless efforts to utilize this marvellous, and hitherto undiscovered, force for all sorts and kinds of purposes and work. There has been a deal of talk concerning the operation of machinery by wireless—so much, in fact, that many people are under the impression that the energy for

TORRENS LAND REGISTERING SYSTEM—TOURMALINE

the operation of far distant machines may be transmitted without wires. Much as wireless has accomplished, it has not done this yet, however, nor does it seem at present probable that it will. What it really has accomplished, in a small way at least, is the starting, stopping and controlling of motors at a distance. That is, the wireless transmission enables engineer or steersman to do his work at a distance, but it is imperative that the engine, in the present state of development, remains where the work is done. But the principle of wireless operation has been applied with very great success to torpedoes.

A French inventor gave demonstrations of the sort on the Seine early in 1910, and clearly proved that he had devised a practicable weapon for use in times of war. The device he used—which has since been accepted as the present standard—when out of water looks like two torpedoes, one above the other and about six feet apart. The upper part is a float, and the lower section is a real torpedo. In it are a motor battery of accumulators, an apparatus for receiving the wireless waves, and, at the nose, an explosive charge weighing 1,800 pounds. The ordinary torpedo can contain only about 200 pounds.

When this mechanism is placed in the water, the engine of destruction sinks to the upper floater, which carries two masts and the usual antennæ for receiving the wireless impulses. Upon the masts are electric lamps, which are lighted as soon as the Hertzian waves reach the antennæ; they are, however, directed aft, in order that they may be quite invisible to an enemy in time of action.

In the recent experiments, the inventor made use of an instrument which somewhat resembled a piano. When he touched one of the keys, the torpedo, at that time some distance away, responded at once. By sending a varying number of waves, he moved the rudder of the device to the right or left exactly as he chose. He made the torpedo turn sharply around in its own length and come directly to him. He had it under absolute control at all stages. These torpedoes are extremely expensive to manufacture, and, because of this, the inventor will not sell one for less than \$11,000. On this account they have not become as common as their utility would lead one to suppose. But in the event of a war between the powers, brought even to the state of perfection which they have at present attained, they would be of inestimable value.

Torrens Land Registering System. The simple method of protecting land titles, devised by Sir Robert R. Torrens, when collector of customs for Australia in 1858, is being rapidly adopted by many American States and will probably become the established general method within comparatively few years. Previous to 1910 it was in operation in a number of States, including Massachusetts, Illinois, Minnesota, California and Colorado, and in 1910 was adopted by New York.

Considerable difficulty in securing passage of Torrens acts has been experienced on account of the opposition of title insurance companies which do a large business in this respect. Attempts were made in New York for 10 years before adequate action could be secured. When Governor Hughes was elected, however, he

secured a commission of experts to investigate the situation. The report of that commission, made after long research, was that most of the systems in use were "antiquated, cumbersome and expensive," and recommended the Torrens system as simple, comprehensive and practical.

Upon presentation of this report, the New York legislature in 1908 passed the Torrens "Land Title Registration law," but, as this law was not properly framed, it was necessary to pass an amendatory act, which received the signature of Governor Hughes in 1910.

The principle of the Torrens system is simple. Since there is no inherent right to property, except that sanctioned by the State, to insure an absolute title to property the acts provide a short statute of limitations, usually six months, within which time all adverse claimants must assert their claims or be forever barred. Suit is brought by the owner seeking registration of his title, appearing as a plaintiff, and the defendants include all other persons, whatever their relation to the matter. An official examiner submits to the court his abstract of title, researches, surveys, etc., and the court then issues an order for the summons and posting and advertising of summons. If an answer is interposed, the issue is tried. Otherwise, at the end of the period of publication, the final judgment and decree of registration is signed by the court, the judgment is entered in the county clerk's register, a certified copy is filed with the registrar, or equivalent officer, who enters it in a book which is kept for that purpose. Then, a certificate of title registration is issued to the owner, and, after the period of time when the statute of limitations has barred all adverse claimants, he is given an absolute title which cannot be disturbed. It is not open to attack from common law wives, posthumous children, infant heirs, people with unrecorded deeds or mortgages. Only one search of title is necessary. Once the title has been registered, everything back of that is blotted out and it is not necessary to take cognizance of it in examining title. Even a judgment filed in the county clerk's office is no lien, unless filed with the registrar. When a property owner with such a certificate wishes to transfer property, he merely surrenders his certificate for cancellation and a new one is issued the purchaser.

Tourmaline. By a single blast of dynamite, Forest L. Havey, a mining expert of many years' experience, laid open valuable layers of tourmaline in 1910. Mr. Havey was mining feldspar on the old David Brown farm, in the town of Poland, Me. An excavation to a depth of about 12 feet under the surface of the ground had been made, when a hard crust-like layer was encountered. A hole was drilled and a charge of dynamite inserted. The explosion lifted the crust-like cover of a basin-shaped depression in solid rock filled with green gem tourmaline. Experts estimated the amount in the single pocket at 6,000 carats. This quality of gem is worth from \$15 to \$25 per carat. Thus the gems uncovered by a single blast of dynamite were worth from \$100,000 to \$150,000. The gems were of unusually clear quality and free from flaws. The smallest cut at least 10 carats, while the largest cut as high as 50 carats. Many of the gems were sold in the rough,

TRADE MARKS REGISTRATION — TRANSANDINE RAILWAY

several being purchased by the Rickers, of Poland Spring House. The discovery attracted much attention among mining experts. While the Auburn Water Works Department was blasting on Gammage avenue, preparatory to laying a new water main, a valuable piece of beryl was found and the blast revealed what appeared to be a rich vein of this valuable mineral. Recent experiments and investigations show beyond a doubt that Maine has one great stratum known as a pegmatic vein, which is believed to begin near Newry and continue to Freeport, a distance of about 80 miles, and to attain a width in some places of at least 40 miles. The vein contains tourmaline, aquamarine, beryl, garnets and other valuable gems.

Trade Marks Registration. The 58th Congress passed an act authorizing the registration of trade marks used in commerce with foreign nations and in interstate business, which was amended by the 59th Congress and again by the 60th Congress, and was approved 18 Feb. 1909. This act provides for copyright on the trade mark by filing with the Patent Office an application with a full description of the article and trade mark used, including a drawing or fac-simile of the mark, and the payment of \$10. The certificate of registration remains in force 20 years, unless it is registered in a foreign country and the previous registration expires earlier. A renewal and payment of the fee can be made at the expiration of the 20-year period. In this case, the request for renewal must be not less than six months prior to the time at which the registration will expire.

The registration under this act is *prima facie* evidence of ownership, and any person using or imitating this trade mark is liable to a suit for damages, the court having permission to increase the verdict to three times the actual damages and cost. The law is aimed at giving complete protection, and the act is so worded as to cover all possible attempt at infringement, leaving no loop-holes by which an actual imitation can be made without violating the law.

The amendment of 18 Feb. 1905 provides that, in order to create the right, the application must be accompanied by a written declaration verified by the persons or corporation filing it. If the trade mark is already registered in a foreign country, it is also necessary to state this fact. The verification can be made by any person qualified to administer oaths. Foreign patents must be taken out through some representative of the United States, or through any person permitted to administer the oath whose authority is proved by a representative of the United States.

Conventions for the reciprocal registration and protection of trade marks have been made with Austria-Hungary, Belgium, Denmark, France, Germany, Great Britain and its colonies, Italy, Japan, Luxemburg, Mexico, Roumania, Russia, Serbia and Spain. Similar relations exist with Switzerland and the Netherlands, but no conventions were necessary, owing to the provision in their constitutions that this privilege is extended to every country which has similar laws.

Transandine Railway. On 5 April 1910, the Transandine Railway, connecting Argentina and Chile, was completed by the opening of the Transandine Tunnel. The tunnel was officially opened on the Chilean side of the mountains at

Caracoles station on that day, the anniversary of the decisive battle of Maipó in the Chilean war of independence. Argentina's official opening of the road was postponed until 25 May, the Argentina Independence Day, and, in 1910, the inaugural date of the Centenary Expedition.

This, the first transandine railway, has 888 miles of rail connecting Buenos Aires and the Atlantic with Valparaiso and the Pacific, and is the work of more than one generation of capitalists, engineers and contractors. The first to conceive the idea of such a road was William Wheelwright, a native of Newburyport, Mass., who, in 1860, outlined a plan for a railway from Caldera, on the coast of Chile, through the mountain pass of San Francisco and ending at Rosario, on the Parana River in Argentina, northward of the route finally chosen. In 1872 Juan and Mateo Clark, two Chilean brothers, applied to the Argentine Government for railway concessions, and in 1874 obtained them. They had already fulfilled a contract for the installation of a transandine telegraph line, and to them a railway appeared to be the logical sequence. In 1878 the contract was signed, but, owing to various obstacles, the Transandine Railway Company was not formed till 1886. In 1888 the first train left Mendoza for the west. Construction work continued steadily for three years thereafter, and then work on the Argentine side was suspended until 1899. Meanwhile the Clarks had obtained a Chilean concession for a railway from Valparaiso, and began work at that end of the route in 1889. Financial embarrassment eventually compelled the brothers to turn their concessions over to an English company which controlled both divisions. From 1899 onward, work on the Argentine side progressed steadily until it approached the tunnel-to-be. On the Chilean side the work went more slowly, but in 1903 a firm of New York and London received the contract to complete the road, and in 1906 the companies representing the road on the two sides of the Andes entered into an agreement for the tunnelling of the mountains by the same contractors, under one control.

This tunnel is two miles long and two miles above sea level, but it is yet 2,000 feet below the mule trail over the mountain pass of Uspallata—12,605 feet above the sea. At the time of the inception of the road this undertaking was regarded as impossible, and many of the difficulties in securing capital arose from doubt whether the road ever could be completed. On 27 Nov. 1909, the workmen approaching from opposite sides of the tunnel came to the last rocky barrier between Argentina and Chile.

It is expected that the completion of this railway will work a revolution in passenger and freight traffic between the two oceans at this latitude. The Transcontinental Express is scheduled to make the through journey, from coast to coast, in about 34 hours, connecting at Valparaiso with the various steamers which sail up the western coast. Formerly the sea voyage through the Strait of Magellan from Buenos Aires to Valparaiso, occupying about 11 days, or a journey over the mountains by diligence and saddle, following a railway journey across Argentina, were the only choice of routes. During five of the winter months the Andean snows made passenger traffic over the mountains dangerous when it was not impossi-

TRANS-CASPIAN RAILROAD—TREASURE HUNTING

ble, and the voyage also was attended with various uncertainties and dangers. There is one defect in the railway which is still to be remedied. The Argentine roads are broad-gauge roads, like those of Chile, while the transandine section is narrow-gauge, and this necessitates trans-shipment of goods at Mendoza and at Los Andes, which tends to delay in travel and necessitates high freight rates.

One of the results of the completion of the railway is the discontinuance of the hazardous and wearisome mail-carrying business over the mountains by human agency. The Andean mail-carrier had need of more endurance, heroism and physical vigor than almost any other carrier on the face of the globe. The mail was carried in leather bags strapped to the back, and the carrier's only refuge in case of the storms which swept the mountains, was the small stone huts built by the government here and there along the trail, that provided neither food nor fire, since wood is usually unobtainable in those latitudes. Often the mail never reached its destination, the carrier having been frozen to death, or lost in the snow. This service was discontinued in May 1910, the railway supplanting it.

The importance of the Transandine Railway seems likely to grow with phenomenal quickness in the years to come, especially after the completion of the Panama Canal. Up to this time, the main traffic along the westward coast of South America has been in guano and a few other limited products of the west coast. The completion of the railway, however, will make it possible for the products of the rich agricultural lands of the Argentine to be exported westward, and many of them are likely to reach the United States instead of going, as they do, mainly to Europe. The scenery is uninteresting until the Bay of Panama is reached, this entrance to the Isthmus being very beautiful, and there is now nothing to tempt either tourist or trader to choose the steamer route from Valparaiso in preference to the land route from Buenos Ayres or Rio Janeiro.

Trans-Caspian Railroad. A trans-Caspian railroad has been a subject of discussion since the Russians built a railway into Baku and Bataum on the Caspian and Black Seas and the British projected lines along the border of Baluchistan and the coast of the Arabian Sea. The realization meant the crossing of some 2,000 miles of Persian territory, but this for years appeared impossible on account of the political antagonism of the two nations whose frontiers would be connected with this link. The understanding between England and Russia in the middle East has revived this scheme of the '80s and is produced as reason not only that the road should be, but will be, built. The Russians, soon after the conquest of the Caucasus, began the development of the region and eventually the building of a railroad along the Caspian Sea from Petrovsk through Derbent to Baku, their only important port on the coast. They then built a line through Tiflis, with a branch to Alexandropol and Erivan, to Porte and Bataum on the Black Sea. In their plans for a southern advance, they have included a network of roads from Baku and Erivan, which is on the Southern frontier, through northern Persia. They have recently secured a monopoly of railroad construction in this region and expect

soon to begin work. Under British control to the south of Persia and separate from it by Baluchistan, is a railway that runs from Karachi on the Arabian sea coast through Quetta to the Afghanistan frontier. The proposed trans-Caspian road would, according to the plans of its projectors, join Quetta on the south and Baku on the north; it would run through Teheran, the capital, and Kashan, Yazd and Kirman, great interior markets of Persia, and thence across Baluchistan. Baku is now connected with Moscow by one of the best lines in the empire; a train with an equipment of sleeping and dining cars similar to those on the trans-Siberian road is operated between the two cities in about 60 hours. The completion of a few miles of projected roads under British control would make a continuous line from Quetta to Bombay. The trans-Caspian road would thus form a link between Moscow and western Europe and Bombay and the system of Indian railroads. It was generally admitted in Europe that the purpose of the visit, made by the Czar to Potsdam in 1910, was the establishment of a political understanding with special reference to Persian affairs. The *Novoe Vremya* of St Petersburg stated that it foreshadowed a Russo-German agreement providing for a junction at Khanakin on the Turkish frontier of the Bagdad railway and the projected north Persian railway to be constructed under Russian auspices. In this case there would be a through line of railway, broken only by the Bosphorus, between Paris and Berlin and the furthest part of India.

Transvaal. See UNION OF SOUTH AFRICA.

Trap Shooting. See SPORTS.

Trask, Spencer, American banker: b. New York, 18 Sept. 1844; killed in a railroad accident, 30 Dec. 1909. On graduation from Princeton he entered the banking business in Wall Street, which he continued throughout life, and was closely identified with the Edison electrical interests and with various railroads, and other large financial enterprises.

Treasure Hunting. The lure of the treasure hunt continued undiminished during 1910; in fact, if anything, it received a more than ordinary impetus. As ever, the famous Captain Kidd treasure, supposed to be on Oak Island, off the Nova Scotian coast, and the reputed Cocos Island missions, received the most attention from those desiring to gain wealth by this romantic path. The treasure of Jean Lafitte, the famous pirate, which lies hidden in some of the inlets of the Gulf of Mexico was also the object of an elaborate quest. The expedition in search of this set sail from Galveston, Texas, headed by Capt. M. Hargruder, and equipped with a geologist, a mining engineer, a civil engineer, and a corps of laborers. Captain Hargruder's father had at one time been associated with Lafitte, and recently Hargruder discovered some old maps with strange markings which he believed held the clue to the whereabouts of the buried loot. The fact that about \$25,000 of the Lafitte treasure has already been recovered made Hargruder's task of raising funds for his expedition a more or less easy one. It is supposed that the bulk of the treasure amounts to many millions. Although it was known that the Hargruder party had

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met with no mishap, up to the end of 1910 they had not yet achieved success in their hunt, though they were still persisting in their efforts. During the summer of 1911 the National Salvage Association of London is planning to make another attempt to save the frigate *Lutine* lost at the entrance of the Zuyder Zee on the night of 9 Oct. 1799, while carrying to Cuxhaven specie estimated at over \$5,575,000. The frigate had sailed at dawn of that day, under orders from Admiral Duncan, of the British navy, containing many merchants' remittances to the continent in support of their credit. Eighteen hours later the *Lutine* was wrecked on the outer bank of the Fly Island passage, directly at the entrance of the Zuyder Zee, and of the entire crew only two men—were picked up. One of these died immediately, and the other before he could be sent back to England or get into conversation with anyone who was able to understand his language. Within a very short time after that, bars of gold and silver and coin were extracted from the hulk to the value of nearly \$300,000. Several attempts have been subsequently made to recover the residue, all of which have been for the most part unsuccessful. The expedition which is being planned for 1911, however, will go about the undertaking in a more elaborate fashion than has any previous one, and the backers of the project are strong in the belief that they will surmount the obstacles which have balked the others. Another treasure hunting expedition, which is being made ready for the summer of 1911 on a large scale, is that of the Bold Salvage and Wrecking Association of New York. They are going after Captain Kidd's spoils at Oak Island. In the summer of 1910 this company conducted a similar expedition, but the work they were able to accomplish at that time was more in the nature of prospecting than real treasure hunting. They discovered on the island, however, at a depth of 170 feet, some material which an expert analysis showed to be artificial cement. This being the case, they argue that some one must have put the cement there, and are equally firm in the belief that the same person, whether or not it was Captain Kidd, buried treasure at the same time. Extensive machinery will be transported to the island and no effort or expense spared to bring to light something valuable. The suggestion has been raised that the cement may have been put there by former seekers, but this does not serve to dampen the enthusiasm of the new expedition in the slightest degree. As a matter of fact this supposition is more than probable, and, what is more, the persons who left the cement are as likely as not to have discovered and taken away with them the much discussed treasure.

History indicates that, while most treasure hunting trips start out with a great flare of trumpets, there is a decided tendency on the part of the seeker, once he finds anything, to slip quietly away and say nothing about it. It seems more than likely that many persons may at this day be fitting out expeditions and spending large sums in the hope of reclaiming treasure which has actually been unearthed, converted into money, and spent long ago. For instance, it is a known fact that shortly after Captain Kidd was hanged in London in 1701, his treasure, or at least part of it, was found on Gardiner's Island. It was so comparatively small an

amount, however, that no one was willing to believe it really represented the whole of his buried loot, and, since Oak Island corresponded in all details to the island where old charts stated the famous pirate's wealth to be hidden, subsequent searches have all been conducted there. In 1909 a company, formed to get this treasure, went to work with an extensive apparatus and claimed to have found an antiquated silver plate and a gold chain. Whether this company has abandoned the field, whether it is still quietly at work there, or whether it has succeeded in locating the treasure and has taken it off, is not entirely clear. Against the story of their findings, though, is the rather unromantic tale of an old Bay of Fundy sailor who formed one of a treasure hunting expedition which explored Oak Island in 1890. He asserts that Kidd's heavy treasure chest was brought to light by this expedition, and found to contain nothing but rum, which he says was drunk by the searchers. This tale is certainly plausible, and bears all the ear-marks of truth. The idea that pirates buried nothing but gold is the popular one, but as a matter of fact they were many times forced to stow away cargoes of rum, whiskey, spices, etc., which they were unable to smuggle into port. The much vaunted Kidd treasure may in truth have been nothing but what this old salt claims.

Of late years, treasure hunters in general have been largely transferring their activities from the West Indies and the Pacific to the North Atlantic coast. The reason for this is that the buccaneers, being afraid of no waters that were in any way navigable, are now supposed to have chosen sites along this coast as being the most unlikely to be discovered by prying eyes. It is along here that Morgan, the master of all pirates, is thought to have left his spoils. An interesting fact in connection with Morgan is that, though in his day the most daring and merciless of all buccaneers, it was really he who succeeded in clearing the seas of pirates. His allied fleet of buccaneers was broken up, but so strong remained the fear of him that, instead of having him hanged as was done with William Kidd, King Charles knighted him and made him governor of the island of Jamaica, specially assigning to him the work of getting rid of all the remaining pirates who had made travel by sea a thing to be feared as the plague. With commendable, if inconsistent, zeal Morgan set about this work, and through his efforts the professional buccaneer disappeared soon after. It was at this period, when they realized that their fall was imminent and foresaw the possibilities of losing all their precariously gained spoils, that the pirates hurried to bury their treasure, selecting the most out-of-the-way spots possible. It is believed that some of this loot was recovered by a mysterious schooner which dropped anchor in 1908 in one of the coves of Campobello Island, just opposite Eastport in Passamaquoddy Bay. The steamer had no cargo and no apparent business to transact in the vicinity, so that the customs officials, believing it to be a smuggler, kept close watch on it. Several nights after its arrival it slipped up the bay and anchored near Casco Island, the customs officers following it in a boat with muffled oars. The crew was seen to put ashore in small boats, each man carrying with him picks, shovels and

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mattocks. Seeing nothing suspicious in this, the customs men went away, and the next day the boat had disappeared, nor was it ever heard from again. Subsequent investigation on the island revealed a newly turned hole in the ground large enough to admit an average size frame house and unmistakable evidences that some large object, like a chest, had been removed from this hole. Just what it was that the mysterious crew obtained, however, and, if treasure, whose it was, will never be known.

The treasure which Cocos Island is supposed to contain has been widely exploited in magazines and newspapers of late. It is estimated that, prior to 1815, \$25,000,000 was deposited there by various pirates, that in 1821 Benito Bonito left \$60,000,000; and that 17 years later "Bug" Thompson, of notorious fame, left \$15,000,000 on the same shores. Innumerable expeditions have been fitted out during the last 50 years to recover these enormous sums, but no one has yet been successful in locating any treasures. Nevertheless, the hunt there still goes on to such an extent that there is hardly a season of the year when some treasure seekers are not at work, the Hackett expedition, setting out from London in Oct. 1910, being the latest of these. The Duke of Argyll has also been a persistent treasure hunter, devoting his efforts toward the discovery of \$30,000,000 worth of gold and precious stones which were reputed to be aboard one of the vessels of the ill-fated Spanish Armada, sunk off the coast of Scotland.

The Duke of Argyll spent thousands of dollars in futile attempts to rescue this treasure until, in the fall of 1910, two divers succeeded in reaching the wreck in question, and reported that the tale of the treasure was a myth, pure and simple, the vessel containing nothing of value except from an antiquarian's viewpoint.

The whole business of treasure seeking is more or less of a romantic and mysterious matter, but it is known that buried treasure does exist in many sections, and some of it has been recovered. It therefore seems probable that, with all the aids which modern science affords, the remainder should sooner or later be brought to light.

This does not mean, however, that efforts to regain treasure which has sunk to the bottom of the sea must necessarily be fruitless. On the contrary, a vast amount of wealth has been recovered since deep-sea diving has become so highly perfected, and some of the most romantic chapters in the whole history of treasure hunting are furnished by these submarine expeditions. Lambert, the famous diver, for instance, heading an expedition in quest of the wealth aboard the *Alphonse XII*, resting under 160 feet of water, off Point Gando, Grand Canary, forced the scuttles of the ship open and, entering into the magazines, obtained \$450,000 in coin of the Spanish realm. Another notable deep-sea recovery was the salvage of about \$50,000 worth of silver bars from the wreck of the steamship *Skyro*. This vessel sailed from Cartagena in 1891, bound for London, with a valuable cargo, including silver bars. The night was foggy and, approaching Cape Finisterre the vessel struck on the Mexiddo Reef, but passed over, finally settling in deep water, two miles off the coast. Three parties

went after this cargo before, in 1897, A. Erostarbe reached it. This recovery was particularly thrilling and hazardous, in view of the fact that strong currents prevail near the position of this wreck, and the day on which the diver descended was rough and stormy. The difficulty of the diver's task is emphasized by the fact that he was obliged to employ dynamite in order to affect an entrance into the cabin where the bars were stowed, while the deck of the craft was collapsed to within 18 inches of the cabin floor on the starboard side of the silver.

Another tale, perhaps even more picturesquely thrilling, is that connected with the *Hamilla Mitchell*, lost on the Leuconna Rock near Shanghai. This boat carried a heavy and valuable cargo, besides specie valued at \$250,000. After this ship, together with all aboard, had been declared irrevocably lost by the highest accepted authorities, a certain Englishman, named Lodge, engaging Messrs R. Ridyard and W. Penk, of Liverpool, England, both expert divers, decided to make a try for it. The adventurers journeyed to Shanghai and proceeded to the scene of the wreck in the pilot cutter *Maggie*. After a long search in depths of water varying all the way from 120 to 160 feet, they at length found the sunken craft. The boat had been rent asunder amidships, and the after part, which contained the treasure, washed out into water more than 20 fathoms deep. It was a labor of hours to gain access to the treasure room, but Ridyard finally accomplished it, and there he found that worms had so eaten into the wooden treasure-boxes as to completely riddle them, while the dollars were lying about in confused heaps. Ridyard made, in all, four successful trips to that room, the last of which proved the most advantageous of all, since on that occasion he sent up the contents of no less than 64 treasure boxes. At that point the advent of a squadron of piratical junks, bearing down upon the seekers, caused them to abandon operations and take refuge in hurried flight. The total amount of treasure which they recovered on that occasion amounted to \$200,000. The balance was regained some time later, but not by them.

Although these recoveries are particularly notable on account of the great depths of water at which they were performed, still larger sums have been brought up from wrecks by divers. Among the most important of the latter was the salvage of bullion amounting to \$1,500,000 from the *Malbar*, the recovery of \$500,000 worth of wool from the *Darling Downs*, and the recovery of cargo and specie valued at \$600,000 from the *Queen Elizabeth*. In nearly all of these cases, too, small articles of historic worth, such as lamps, vases, knives and crucifixes, were also brought to light.

Treaties. *Austria-Hungary*.—Copyright— a proclamation by the President of the United States 20 Sept. 1907, under the regulation that the copyright laws should apply to all citizens of countries, which granted the same privileges to the citizens of the United States. Arbitration convention, according to the convention for the pacific settlement of international disputes, concluded at The Hague, 30 July 1899, providing that the settlement of legal disputes be referred to the Permanent Court of Arbitration established at The Hague; signed

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15 Jan 1909; ratified 1 March 1909; proclaimed 18 May 1909.

Belgium—Protection of trade marks in China, agreement effected by exchange of notes 27 Nov. 1905.

Brazil—Naturalization convention (vide Honduras) signed 27 April 1908; ratified 26 Dec. 1908; proclaimed 2 April 1910.

Bulgaria—Reciprocity, a proclamation by the President of the United States declaring special tariff rates on Bulgarian products, in recognition of a similar action on the part of Bulgaria, 15 Sept. 1906.

China—Arbitration convention (vide Austria-Hungary) signed 8 Oct. 1908; ratified 1 March 1909; proclaimed 6 April 1909. New Agreement between China and certain Powers modifying the final protocol of 1901 concerning the Whang Pu convention, concluded 27 Sept. 1905.

Costa Rica—Arbitration convention (vide Austria-Hungary) signed 13 Jan. 1909; ratified 1 March 1909; proclaimed 21 July 1909.

Cuba—Protocol amending Spanish Text of Cuban Extradition treaty; signed 6 Dec. 1904; ratified 24 Jan 1905; proclaimed 8 Feb. 1905.

Denmark—Supplementary extradition treaty, extending the extradition treaty to the island possessions and defining the procedure by which applications for the surrender of accused persons from such island possessions or colonies shall be made, and a list of extraditable crimes; signed 6 Nov. 1905; ratified 13 Feb 1906, proclaimed 19 Feb. 1906. Agreement by exchange of notes on 22 June and 26 June 1906, with respect to the protection of industrial designs for models, signed 22 June 1906. Protection of trade marks in China; agreement effected by exchange of notes, 19 March 1907. Arbitration convention (vide Austria-Hungary) signed 18 May 1908; ratified 8 Jan 1909; proclaimed 29 March 1909.

Dominican Republic—Convention providing for the assistance of the United States and application of the customs revenues of the Dominican Republic, concluded 8 Feb. 1907; ratified 22 June 1907; proclaimed 25 July 1907. Extradition; signed 19 June 1909; ratified 29 April 1910; proclaimed 26 Aug. 1910.

Ecuador—Arbitration (vide Austria-Hungary) signed 7 Jan. 1909; ratified 1 March 1909; proclaimed 23 June 1910.

France—Protection of trade marks in China, agreement effected by exchange of notes, 3 Oct 1905. Additional commercial agreement, signed 28 Jan 1908. Arbitration convention (vide Austria-Hungary) signed 10 Feb. 1908; ratified 27 Feb. 1908; proclaimed 14 March 1908.

German Empire—Protection of trade marks in China, agreement effected by exchange of notes 6 Dec 1905. Commercial proclamation, reciprocity, signed 27 Feb 1906. Commercial agreement, signed 27 April-2 May 1907; articles, concessions by United States, customs and consular regulations, concessions by Germany; importations through third countries; application to territories. Patent convention, concluded 23 Feb. 1909; ratified 20 April 1909, proclaimed 1 Aug 1909.

Great Britain—Treaty relinquishing extra-territorial rights in Zanzibar, concluded 25 Feb 1905; ratified 12 May 1905; proclaimed 12 June 1905. Alaska Boundary—exchange of notes—acceptance of the report of the commissioners

to complete the award under the convention of 24 Jan 1903, agreement effected 25 March 1905. Supplementary extradition convention, concluded 12 April 1905, ratified 21 Dec 1906; proclaimed 12 Feb 1907. Protection of trade marks in China, agreement effected by exchange of notes 28 June 1905. Alaska Boundary convention, appointment of commissioners; marking of meridian, concluded 21 April 1906; ratified 10 July 1906; proclaimed 21 Aug 1906. Modus vivendi between the United States and Great Britain in regard to inshore fisheries on the treaty coast of Newfoundland, agreement effected by exchange of notes 6-8 Oct 1906. Protection of patents in Morocco, agreement effected by exchange of notes 4 Feb 1907. Modus vivendi between the United States and Great Britain in regard to inshore fisheries on the treaty coast of Newfoundland; agreement effected by exchange of notes 4-6 Sept 1907. Proclamation regarding admission of works of art in return for privilege of free admission of samples of dutiable goods, 5 Dec 1907. Arbitration convention (vide Austria-Hungary); signed 4 April 1908; ratified 11 May 1908; proclaimed 5 June 1908. Treaty concerning the Canadian International boundary line, containing articles regarding boundaries; through Passamaquoddy Bay; from the mouth to the source of the St Croix River; from the source of the St Croix to the St Lawrence, from the St. Lawrence to the mouth of the Pigeon River; from the Pigeon River to the Lake of the Woods; from the Lake of the Woods to the Summit of the Rocky Mountains, from the Rocky Mountains to the Gulf of Georgia; from the forty-ninth parallel to the Pacific Ocean; concluded 11 April 1908; ratified 11 May 1908; proclaimed 1 July 1908. Special agreement, submitting to arbitration the North Atlantic Coast fisheries, signed 27 Jan 1909, ratified 18 Feb. 1909; confirmed by exchange of notes 4 March 1909. Concerning Newfoundland Fisheries, agreement effected by exchange of notes 22 July to 8 Sept 1909. Boundary waters between the United States and Canada; signed 11 Jan 1909; ratified 1 April 1910, proclaimed 13 May 1910. Boundary line in Passamaquoddy Bay; signed 21 May 1910, ratified 31 July 1910; proclaimed 3 Sept 1910.

Guatemala—Patent convention signed 19 Nov. 1906; ratified 6 March 1907; proclaimed 9 July 1907.

Haiti—Extradition convention, including delivery of accused; extraditable offenses, attempt to commit crimes; nondelivery of citizens; deferring extradition persons claimed by other countries; political offenses, offense for which to be tried; provisional detention; demand; requisition; concluded 9 Aug. 1904; ratified 17 June 1905; ratification exchanged 28 June 1905. Arbitration convention (vide Austria-Hungary) signed 7 Jan. 1909; ratified 1 March 1909; proclaimed 16 Nov 1909.

Honduras—Naturalization convention—including, naturalization recognized; readmission to former status; definition of "citizen;" liability for offenses committed before emigration; declaration of intention; concluded 23 June 1908; ratified 26 Dec 1908; proclaimed 8 June 1909.

Italy—Protection of trade marks in China; agreement effected by exchange of notes 18 Dec. 1905. Arbitration convention (vide Austria-Hungary), signed 28 March 1908; ratified

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19 June 1908; proclaimed 25 Jan. 1909. Supplementary commercial agreement, signed 2 March 1909; proclaimed 24 April 1909

Japan—Copyright convention, including reciprocal protection, translation of books, etc; signed 10 Nov 1905; ratified 7 March 1906; proclaimed 17 May 1906. Supplementary extradition on convention, adding the embezzlement of private moneys or property and larceny to the list of extraditable offences, signed 17 May 1906; ratified 28 June 1906; proclaimed 26 Sept 1906. Arbitration convention (vide Austria-Hungary); signed 5 March 1908; ratified 19 Aug. 1908; proclaimed 1 Sept 1908. Treaty concerning protection of trade marks in Korea; concluded 19 May 1908; ratified 2 June 1908; proclaimed 11 Aug 1908. Treaty concerning protection of trade marks in China, concluded 19 May 1908; ratified 2 June 1908; proclaimed 11 Aug 1908. Notes exchanged between the United States and Japan 30 Nov. 1908, declaring their policy in the Far East to be the encouragement of free and peaceful development of the commerce on the Pacific Ocean and the maintenance of the status quo

Luxemburg—Declaration for the protection of trade marks, signed 23 Dec. 1904; ratified 15 March 1905; proclaimed 15 March 1905.

Mexico—Convention for the elimination of bancos in the Rio Grande from the effects of Article II of the treaty of 12 Nov 1884 and the agreements concerning the formation of an international commission and the formation of future bancos; concluded 20 March 1905; ratified 13 March 1907; proclaimed 5 June 1907. Convention providing for the equitable distribution of the waters of the Rio Grande for irrigation purposes, concluded 21 May 1906; ratified 26 Dec. 1906; proclaimed 16 Jan. 1907. Arbitration convention (vide Austria-Hungary); signed 24 March 1908; ratified 29 May 1908; proclaimed 29 June 1908.

Netherlands—Extradition convention; concluded 18 Jan 1904; ratified 26 May 1904; proclaimed 31 May 1904. Protection of trade marks in China; agreement effected by exchange of notes 23 Oct 1905. Commercial agreement; signed 16 May 1907; proclaimed 12 Aug. 1908. Arbitration convention (vide Austria-Hungary); signed 2 May 1908; ratified 8 Jan. 1909; proclaimed 25 March 1909.

Nicaragua—Extradition treaty; concluded 1 March 1905; ratified 11 June 1907; proclaimed 15 June 1907

Norway—Amendatory extradition treaty to conform with new penal code in Norway abolishing imprisonment at hard labor; concluded 10 Dec 1904; ratified 1 April 1905; proclaimed 6 April 1905. Copyright proclamation by the President of the United States 9 July 1905. Arbitration convention (vide Austria-Hungary); signed 4 April 1908; ratified 18 June 1908; proclaimed 29 June 1908.

Panama—Extradition treaty; concluded 25 May 1904; ratified 20 Jan. 1905; proclaimed 12 May 1905.

Paraguay—Arbitration convention (vide Austria-Hungary); signed 13 March 1909; ratified 10 Aug. 1909; proclaimed 11 Nov. 1909.

Peru—Naturalization convention (vide Honduras); signed 15 Oct 1907; ratified 9 March 1908; proclaimed 2 Sept. 1909. Arbitration convention (vide Austria-Hungary); signed 5 Dec. 1908; ratified 1 March 1909; proclaimed 30 June 1909.

Portugal—Arbitration convention (vide Austria-Hungary); signed 6 April 1908; ratified 6 Nov 1908; proclaimed 14 Dec. 1908. Naturalization convention; signed 7 March 1908; ratified 6 Nov 1908; proclaimed 14 Dec 1908. Extradition and exchange of notes concerning death penalty, signed 7 May 1908; ratified 26 Oct. 1908; proclaimed 14 Dec. 1908.

Rumania—Convention between the United States and Rumania for the mutual protection of trade marks; signed 18 March 1906; ratified 10 May 1906; proclaimed 25 June 1906

Russia—Agreement regulating the position of corporations and other commercial associations; signed 25 June 1904; ratified 7 June 1907; proclaimed 15 June 1909. Protection of trade marks in China, agreement effected by exchange of notes 28 June 1906

Salvador—Naturalization convention (vide Honduras); signed 14 March 1908; ratified 26 May 1908; proclaimed 23 July 1908. Arbitration convention (vide Austria-Hungary); signed 21 Dec 1908; ratified 1 March 1909; proclaimed 7 July 1909

San Marino—Extradition treaty; signed 10 Jan. 1906; ratified 7 May 1908; proclaimed 12 June 1908.

Spain—Extradition treaty and protocol; concluded 15 June 1905; protocol signed 13 Aug. 1907; ratified 5 Feb. 1908; proclaimed 21 May 1908. Commercial agreement to reciprocal tariff concessions between the United States and Spain under Section 3, Tariff Act, 24 July 1897, signed 1 Aug 1906, and explanatory notes exchanged 20 Dec 1907. Supplemental commercial agreement effected by exchange of notes; signed 20 Feb. 1909. Arbitration convention (vide Austria-Hungary); signed 20 April 1908; ratified 28 May 1908; proclaimed 3 June 1908.

Sweden—Arbitration convention (vide Austria-Hungary); signed 2 May 1908; ratified 6 July 1908; proclaimed 1 Sept 1908

Switzerland—Reciprocity; proclamation by the President of the United States 1 Jan 1906. Arbitration convention (vide Austria-Hungary); signed 29 Feb. 1908; ratified 29 May 1908; proclaimed 23 Dec. 1908

Uruguay—Extradition treaty; concluded 11 March 1905; ratified 12 April 1908; proclaimed 10 July 1908. Naturalization convention (vide Honduras); 10 Aug 1908; ratified 26 Dec. 1908; proclaimed 19 June 1909.

Venezuela—Claims protocol; including claims of the Orinoco Steamship Company; claims of the Orinoco corporation; claims of the United States and Venezuela Company; submission to The Hague; signed 13 Feb. 1909. Protocol concerning settlement of claims of United States and Venezuela Company; signed 21 Aug 1909. Protocol of settlement between the United States of America, on behalf of the Orinoco Corporation and of its predecessors in interest, the Manoa Company Limited, the Orinoco Company, and the Orinoco Company Limited, and the United States of Venezuela; signed, 9 Sept. 1909.

INTERNATIONAL CONVENTION AND ACTS TO WHICH THE UNITED STATES IS A PARTY

1904.—Agreement between the United States and other powers for the repression of the trade in white women; signed Paris, 18 May 1904; adhered to by the President 6 June 1908; proclaimed 15 June 1908. Convention for the

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exemption of hospital ships in time of war from the payment of all dues and taxes imposed for the benefit of the state; concluded, The Hague, 21 Dec 1904; ratified 16 Oct. 1906; proclaimed 21 May 1907.

1905 — Convention for the creation of an institute of agriculture; signed 7 June 1905; ratified 7 July 1906; proclaimed 29 Jan. 1908. International sanitary convention; concluded 14 Oct 1905, ratified 29 May 1906, proclaimed 1 March 1909

1906 — General act of the International Conference at Algeciras regarding Morocco; signed Algeciras, 7 April 1906; ratified 4 Dec. 1906; proclaimed 22 Jan. 1907. International Red Cross Convention at Geneva, Switzerland, for the amelioration of the condition of the wounded of the armies in the field; concluded 6 July 1906; ratified 2 Jan. 1907, proclaimed 3 Aug. 1907. International convention on the importation of liquors into Africa; revising the duties imposed by the Brussels convention 8 June 1899, on spirituous liquors imported into certain parts of Africa; concluded 3 Nov. 1906; declaration of adherence 19 Feb. 1907; proclaimed 2 Dec. 1907. Agreement respecting the unification of the pharmacopœial formulas for potent drugs; signed, Brussels, 29 Nov 1906

1907 — Agreement for the establishment of the International Office of Public Health; concluded at Rome 9 Dec 1907; ratified 15 Feb. 1908; proclaimed 17 Nov. 1908. Conventions concluded at the Second International Peace Conference at The Hague, 18 Oct 1907; ratified 23 Feb 1909; proclaimed 28 Feb 1910. Respecting the limitation of force in the collecting of contract debts; relative to the opening of hostilities; respecting the laws and customs of war on land; respecting the rights and duties on neutral powers and persons in war on land; respecting the laying of automatic submarine contact mines; respecting bombardment by naval forces in time of war; for adaptation to naval war of the principles of the Geneva Convention; relative to the rights of capture in naval war; concerning the rights and duties of neutral powers in naval war; prohibiting the discharge of projectiles and explosives from balloons, relative to the creation of a Judicial Arbitration Court.

1908 — Treaties and convention concluded at the Central American Peace Conference held in Washington, 1907, between the Governments of Costa Rica, Guatemala, Honduras, Nicaragua, and Salvador; brought about by the United States and concluded under the governments of the United States and Mexico.

Trengganu. A piece of British Territory in the Malay Peninsula. It was ceded to Great Britain at the Treaty of Bangkok, signed 10 March 1909, together with the other Siamese tributary States, Kelantan, and Keda. Trengganu, however, never did acknowledge the sovereignty of Siam. It joined the Federated Malay States on 18 Feb. 1910. The area of Trengganu is about 4,500 square miles, and the population is estimated at about 115,000. The great majority of the inhabitants are Malays, but there are large numbers of Chinese. The dominant religion is Mohammedanism. The chief agricultural products are cocoanuts, rice, rubber, resin, bamboo and sugar-cane. Live-stock is comparatively plentiful. The chief town is of the same name as the country.

Trinidad and Tobago. Among the British West Indies, and furthest to the south. Venezuela is only seven miles distant. The area is about 1,865 square miles, and the population of both islands (1909-10) about 351,400. The principal town and port is the Port of Spain, with about 60,000 inhabitants. It is one of the most up-to-date towns in the West Indies, being equipped with electric lights and telegraph wires. Other towns are San Fernando, 7,600 inhabitants, Princetown, 4,500 inhabitants, and Arima, 4,100 inhabitants. A Governor has in hand the administration of affairs. He is assisted by an Executive Council and a Legislative Council, all the members being nominated. The revenue for 1909-10 amounted to about \$4,265,000, and the expenditure to \$50,000 in excess of the receipts. The debt in 1910 amounted to about \$5,800,000. The history of the islands dates back to its colonization in 1588, by the Spaniards. Trinidad was discovered by Columbus in 1498. The British came into possession of the colony in 1797. The soil is fruitful, and favorable to the production of sugar, cocoa, cocoanuts, timber and fruits. Among the products of the country, also, are molasses, rum, etc. There is a remarkable lake of pitch; the value of over \$770,000 was exported in 1909. Total exports in that year amounted to \$16,090,000, and the imports to the value of about \$16,440,000. There are 90 miles of railway in operation. Telegraph wires of the West India and Panama Company pass the islands. About 44 steamers visit the ports monthly, 38 being from Europe and 6 from America.

Trobec, James, R. C. bishop: b Billichgraz, Carniola, Austria, 10 July 1838. He was educated in Laibach, Austria, and in 1864 joined Father Pirc, who was going to America as a missionary to the Indians in Minnesota. He finished his theological course at St. Vincent's college in Pennsylvania, and was ordained priest by Bishop Grace, at St. Paul, Minn., 8 Sept. 1865. He engaged in missionary work at Bille Prairie, Minn., 1865-66 and at Wabash, Minn., 1866-67. In the latter year he was called to St. Paul, where he organized St. Agnes' parish, and was pastor 1887-97. He was elected bishop of St. Cloud, Minn., 5 July 1897, and was consecrated 21 Sept. 1897 at St. Paul by Archbishop John Ireland, assisted by Bishops Katyer and Yertin. On 28 Sept. 1897 he was installed at the Cathedral of St. Cloud, Minn., by Archbishop Ireland.

Tropical Medicine. See **MEDICINE.**

Trotting. See **SPORTS.**

Troubetzkoy, Amelie, American novelist: b. Richmond, Va., 23 Aug 1863; educated by private tutors; married John Armstrong Chaloner (1888), divorced; married Prince Pierre Troubetzkoy, 18 Feb 1896. Princess Troubetzkoy during the last few years has spent most of her time at her husband's home, Villa Ada, on Lake Maggiore, Italy. Her output of literature keeps up to a yearly novel. 'The Golden Rose' was published in 1908; 'Trix and Over-the-Moon,' 1909; and 'Pan's Mountain,' 1910.

Trust Companies. In 1910, there were 1091 loan and trust companies reporting. Of this number, 507 were in the Eastern States, 242 in the Middle West, and 129 in the South. Pennsylvania had 304, the largest number. The

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report of the Comptroller of the Currency for 1909 showed 1,079 trust companies. In point of numbers, Pennsylvania ranked first, with 278, of which 60 were in Philadelphia, and 41 in Pittsburgh. New York had 85, of which New York City had 39. The Illinois trust companies numbered 42, of which Chicago had 19. There were 842 loan and trust companies in June 1908. New York had 88; Pennsylvania, 327; Indiana 91; New Jersey 75, Massachusetts 52. The 1907 trust companies numbered 794. The New England States had 125; the Eastern, 505; Middle, 131, and Kansas, 5.

In point of resources, the New York trust companies stand at the head. These were \$1,574,889,000 in 1909, of which the companies in the city of New York had \$1,318,775,000. The resources of similar institutions in Chicago were \$475,282,000. For 1908, the trust companies of New York State held 44 per cent of the total resources of all the companies, though the capital of those in Pennsylvania was greater.

The aggregate resources in 1910 were \$4,216,850,061.⁵² Of this sum, the resources of the institutions of the Eastern States totalled \$2,657,262,821.⁴⁸, the Southern, \$80,213,774.⁴⁹, and the Middle West, \$532,567,450.²⁰. The loans and discounts aggregated \$2,256,572,910.⁶⁴; investment in bonds and other securities, \$1,000,263,549.⁸⁴; cash on hand \$260,129,890.⁹¹. The total trust company resources for 1909 was \$4,068,534,000. This represents an increase of 41 per cent in four years. These resources were equal to about one-fifth the total resources of all the banks in the United States, and more than two-fifths of the national. They included loans on real estate and mortgages owned, \$377,318,000; loans on other collateral, \$1,222,881,000; other loans and discounts, \$460,550,000; stocks and bonds, \$900,190,000; cash on hand, \$264,000,000. The total resources for 1908 were \$2,865,632,000. Compared with June 1907 this was a decrease of \$205,786,000. Here are some of the items; loans, \$1,380,432,000; investments in bonds and other securities, \$775,875,000; cash on hand, \$118,308,000. The 1907 resources were \$3,071,419,000.

In 1910 the capital was \$367,333,556.³⁷ and the surplus and profits \$498,166,835.⁵⁰

The combined capital and surplus and undivided profits for 1909 were \$856,145,000. For 1908, the capital stock paid in was \$278,408,000, and the surplus and undivided profits, \$416,039,000. In 1907, the capital, surplus, and undivided profits were \$674,010,000.

The individual deposits in 1910 were \$237,287,525.⁴¹ and in 1909, \$2,835,835,000. In 1910 the companies had 20.1 per cent of the individual deposits of all banks. In 1909, 20.2 per cent as compared with 14.6 per cent in 1908. They included \$657,697,000 of savings deposits credited to 1,965,000 depositors and drawing an average of 3.43 per cent interest. Non-savings deposits drew about 2.34 per cent. The cash on hand was slightly less than 8 per cent of the deposits subject to check. The deposits for 1908 were \$1,866,964,000, and for 1907, \$2,061,623,000, of which the New York State companies had \$1,020,678.

The financial panic took place during the latter part of 1907. Four trust companies were forced to suspend. This caused the deposits of the trust companies of Greater New York to decrease \$354,696,000, or 34 per cent. There was also a shrinkage of resources of \$362,113,

191 from 22 Aug 1907 to 19 Dec. 1907. The situation, however, readjusted itself so rapidly that, on 31 Aug 1908, the companies showed deposits of \$945,393,597, or about as much as they held 27 Aug. 1907.

During the year 1908, important legislation was passed which settled the reserve fund controversy. But a few years before, it had brought about a breach between the trust companies and the Clearing House. Under the new act, trust companies in the City of New York, Manhattan borough, are required to maintain a cash reserve of 15 per cent against deposits all in cash; those in other boroughs, 15 per cent, of which two-thirds must be in cash; and those elsewhere, 10 per cent or one-half in cash. Prior to the passage of this act, the trust companies were only required to maintain a low cash reserve against deposits.

The last of "Surplus Certificates A" of The Knickerbocker Trust Company were taken up 14 March 1910. They were issued when the company resumed business in March 1908, after the failure in Oct. 1907. The suspension of The Knickerbocker helped materially to bring on the panic. It led to the heavy withdrawal of funds from other institutions. From a financial standpoint, the taking up of these certificates was one of the most important operations in the after-panic finance of the last two years. For five months, the trust company was in the hands of receivers. When business was resumed, the settlement of the depositors was in certificates of deposit for 70 per cent of their claims, bearing interest at 3 per cent and 4 per cent surplus certificates for the remainder. The certificates of deposit were payable in installments, covering a period of 28 months. They were issued for \$35,000,000. This represented the sum deposited with The Knickerbocker at the time of its suspension. The liquidation of the surplus certificates became an important matter. A syndicate without compensation was formed to purchase at par and accrued interest any of the surplus certificates which the holder might not care to exchange for new stock in the company at the rate of \$300 per share. The syndicate succeeded in taking up all the "Surplus A" certificates and the voting trustees appointed in 1908 retired. When the trust company was reorganized, the stockholders contributed \$2,400,000 in cash. They had received surplus B certificates for this. They surrendered them for the new stock at \$300 per share. Following the retirement of those certificates, the company found itself in a strong position with clean assets, a competent management, capital of \$3,200,000, surplus of \$5,750,000, and deposits of \$35,000,000. Its depositors numbered 18,000 as against 17,000 when it suspended. The Knickerbocker Trust Company had the same weakness as other trust companies had before legislation affecting reserves was enacted. These institutions were sharply competing for deposits at the time. As a consequence, they offered exorbitant rates for accounts and conducted a business largely made up of demand deposits upon a shoe string reserve. The Knickerbocker is a case in point. It paid out \$8,000,000 in cash on the day it suspended. There were time loans on the books of \$25,857,000. More than 40 per cent of these represented syndicate underwriting, and tied up its

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funds for a long period and committed it to enormous future expenditures. The company really needed a 50 per cent reserve or even more in view of having nine-tenths of its deposits subject to sight withdrawals. This was the only safe basis. Few of the assets at the time of the failure were collectible as quickly as within 30 days or six months. More were due between six months and a year, and a large number had to be carried for one and two years, while others only could be reduced to cash between two years and two years and six months.

Trusts. With the close of the year 1910 the legal and economic situation involving business combinations reached a point which, it was generally agreed, called for immediate solution. The cases before the Supreme Court of the United States growing out of the Sherman Anti-Trust law were estimated to involve no less than \$15,000,000,000, a sufficiently important sum to affect the prosperity of the entire country. The difficulty lay in a remedy which would not interfere with legitimate business enterprise but would check abuses. Business combinations not in restraint of trade no matter how great an amount of capital involved, it was the general sense of public opinion, violated no law and the decisions of the courts appeared to bear out this point of view. The fight against trusts, which the Government had been carrying on with unflinching perseverance, was at this time confined to cases where the trusts appeared to be guilty of combinations in restraint of trade, creating artificial and injurious economic situations.

The crux of the problem lay in formulating laws and securing rulings from the Supreme Court of the United States which would differentiate and make quite clear the distinction between combinations which are legal and those which are not. Business sentiment in general was for a final and prompt decision providing proper punishment for the violators of the law and a general recognition of the right to make business combinations which were within the law. As to the means of accomplishing this result, the ablest statesmen and financiers in the country had not at this time been able to arrive at a definite conclusion, and the divided attitude of Congress left the ultimate settlement problematic.

The example set by Germany in its control of the trusts was not generally favored in this country, as it was of a distinctly socialistic character. The American sentiment was by a large majority in favor of upholding purely democratic principles, a policy inimical to government interference except in the cases where the trust is without the law. The disadvantage in this attitude was that it has been used as a shield by illegal trusts against which it has not been possible under the present laws to secure evidence sufficient to cause conviction and dissolution. As a compromise the suggestion was made, originating among the most powerful financiers, that a commission be formed with powers similar to those of the Interstate Commerce Commission, to have control of corporations dealing with interstate business. This would involve a Federal Incorporation law under which corporations wishing to do interstate business could incorporate. The powers of this commission would necessarily

be limited by Congress within certain bounds, but what these bounds should be remained an open question. Certain large financial interests even voiced a willingness to have the commission empowered to fix the maximum prices at which commodities might be sold, based upon an investigation of cost of production. Having such a commission with these or other powers, it was agreed that all corporations which would be unwilling to subject themselves to these regulations be barred from engaging in interstate commerce. To make the commission effective, it would have to be enabled to investigate summarily all complaints of oppression and unfair competition and to direct criminal prosecutions and suits to forfeit charters.

The German method of dealing with trust problems was evidenced in the law passed by the Reichstag, May 1910, regulating the production of potash, an industry in which Germany is preeminent. There were, previous to that time, 54 companies engaged in producing potash, which had an output in excess of the demand, depleting the supply and bringing about ruinous business conditions. The new law provides for a court which is to determine the demand and establish a maximum price. The law was fathered by the Socialistic Party.

While not carrying the solution of the problem to such a length, there is a certain disposition to treat the large combinations of business as quasi-public corporations and subject them to government control. A means of bringing this about had not yet been evolved, and the Supreme Court of the United States faces problems which involve the prosperity of the entire country, dealing with questions not hitherto raised and calling for constitutional construction having far-reaching effect.

Sugar Trust.—The most important action taken during 1910 by the Government under the Sherman Anti-Trust law was the filing of the suit for dissolution against the American Sugar Refining Company and its 29 subsidiary companies, known as the Sugar Trust. The Federal petition charged the company with being a persistent violator of the Sherman Anti-Trust law. The petition was prepared by United States District-Attorney Henry A. Wise, and filed in the United States Circuit Court in New York City. Summarized, the petition declared that the trust had stifled competition by purchasing a controlling interest in competing concerns, and, where that was impossible, crushing out competitors by underselling in the territory. To make this effective, the petition declares the trust had systematically secured rebates from railroad lines, and cited convictions and fines imposed against the transportation companies as evidence.

The petition also declared that the late Henry O. Havemeyer, known in his lifetime as the controlling power in the trust, received \$10,000,000 in common stock in the National Sugar Refining Company of New Jersey, when there were taken into the trust the National Sugar Refining Company, operated by B. H. Howell's Son & Co.; the New York Sugar Refining Company of Long Island City, operated by Claus Boshier; the Mollenhauer Sugar Refining Company of Brooklyn; and the W. J. McCabe Sugar Refining Company of Philadelphia. All but \$500,000, the petition declares, was actually received by Henry O. Havemeyer.

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The petition asks to have the trust enjoined from conducting interstate business in its whole and all its parts. The complaint undertakes to point out, step by step, how the trust was formed, showing in detail its fight against competitors and the methods adopted to prevent competitors from selling at a reasonable profit. The allegation that the trust controlled the whole sugar production, and not 90 per cent, as formerly believed, was one of the surprises of the suit.

In general reply to the petition, as expressed by the officials of the trust, it is held that there is no trust, and that the American Sugar Refining Company has no connection with other concerns. It admits to controlling only 51 per cent of the sugar trade. It is also stated that the average holding of the stocks is 50 shares, scattered among 19,000 shareholders, half of them women. It has also been stated that the officials are prepared, if the suits against the Standard Oil and American Tobacco companies are decided adversely, voluntarily to comply with the law as interpreted. A statement to this effect was made by James M. Beck, counsel for the Sugar Trust.

In Dec. 1910, the United States Government agreed to accept \$700,000 from the American Sugar Refining Company to reimburse the Government for sums out of which it had been previously defrauded. A severe blow was dealt the sugar trust and, through it, all trusts, in the decision of the United States Supreme Court of 12 Dec. 1910, that conspiracy to control prices under the Sherman Anti-Trust Law is a continuing offense and that the statute of limitations does not protect conspirators from trial by jury. The Anti-Trust law is thereby held to be a criminal statute, and the law is established that conspiracy is a crime so long as the state of affairs brought about by the conspiracy continues to exist.

Window Glass Trust.—The Imperial Glass Company of Pittsburgh, which was organized in April 1909, as a selling agency, and which manufactured no glass but purchased the output of more than 50 factories, was dissolved by the United States Court early in Nov. 1910. The stock of the Imperial Glass Company was divided among the manufacturers concerned. The agreement entered into between the trust and the companies was that they were to sell only to the trust. Under this arrangement, the trust brought into combination with it manufacturers of about 97 per cent of the entire hand-blown window glass manufactured in the United States. It began business in Jan. 1910, and, by Oct. 1910, prices had advanced 70 per cent over what they were in April 1909.

Evidence produced at the trial showed that in the first three months of its operations the trust had earned net profits equal to its entire capital stock. The largest advance in prices was subsequent to this initial period. The evidence further showed that during the 10 months of its business the trust had cleared \$1,000,000, or 400 per cent on its capital stock. It was also shown that it leased 15 factories at high rentals and closed them, removing their product from the market. For leases and watchmen these closed factories cost \$138,000 a year.

Indictments were found against the 15 directors and officers of the company, each of whom was either president or a prominent of-

ficer of one of the companies which had entered into the agreement. The case was set for trial 14 Nov. 1910, and, a few days previous to this date, as Attorney-General Wickersham later stated, various overtures were made by the officials of the company who agreed to plead *noli contendere*, which is practically not guilty, provided the Government would impose only fines. Thus the Government refused to do on the grounds that it was one of the most intentional and flagrant violations of the anti-trust law which had been brought to the attention of the Attorney-General. To quote Attorney-General Wickersham, "the defendants appeared in court in Pittsburgh and interposed pleas of *noli contendere*, and despite the opposition of the District-Attorney and Special Assistant Governor, the court only fined each of the individual defendants \$500 and the corporation \$2,500 and costs."

A report followed the dissolution that the wages of the men would be cut in some cases as much as 60 per cent. This was taken by the Attorney-General to indicate a spirit of defiance on the part of the glass companies, and he expressed his opinion that the imposition of fines was inadequate and "a very mistaken leniency on the part of the court." The explanation offered by the companies which had formed the combine was that they were compelled, after dissolution, to compete with the machinery factories on an unequal basis and that wages naturally fell.

United States Judge Young, in imposing fines, said that he had taken into consideration the fact that the indicted directors had assisted the Government in its investigation and had not prosecuted business after the demurrer which they had filed to the complaint was dismissed in October.

Bathtub Trust.—The Standard Sanitary Manufacturing Company and 15 other corporations engaged in the manufacture of bathtubs were the subject of a Governmental investigation which began in Pittsburgh 31 Oct. 1910, before Lindsay C. Spencer, special examiner appointed by the United States Circuit Court. Violations of the anti-trust law were alleged by the Government, and the companies concerned were represented by counsel to combat the charge. The principal witness was Edward I. Weyman, who told of an agreement which he drew up that was signed by the 16 defendants, in which the corporations agreed upon a penalty for the violation of regulations controlling the marketing of their products.

The jobbers' license agreement under which they worked was identified by Weyman, who acted as licensor. He pointed out that there were 16 furnaces involved, each license paying the licensor \$5 a day on each furnace for the use of various patents. When the licensee observed the agreement, however, it was provided that the licensor should return 80 per cent of the original amount paid by the license, as a rebate. Weyman also showed that the 16 defendants could not sell any sanitary ware in the United States without first having a contract with him. He also told of a "bluebook" which contained the names of plumbing supply houses eligible to make contracts with the 16 manufacturers. Weyman further told of a meeting, which he said took place in New York, at which 91 per cent of

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the enameled iron ware manufacturers were represented and that an agreement had been made among them. Weyman's position as licensor, he admitted, was a means of securing an agreement on prices.

A large number of jobbers were called upon to testify, and swore that they had not been able to purchase until after they had entered into an agreement by which the licensor was able to fix the prices which they charged to the trade. Weyman himself admitted that he had made the changes in the catalogues which fixed the retail price. Jobbers also swore that they were unable to secure supplies unless they bought of the trust. On a price list sent out 15 September, is the warning "Cash discount. On sale to plumbers, the jobbers or manufacturers shall not allow in excess of 2 per cent for cash." And on another sheet the words are underlined: "Goods must be sold to the plumber at the quality prices established in the sheets."

On 6 Dec. 1910, indictments were brought in Detroit against the 16 firms and 32 individuals accused of having control of 85 per cent of the annual output of enamel ironware bathtubs, sinks, lavatories, etc. The indictments grew out of a civil suit to dissolve the combination, and evidence was brought out at the hearing which prompted criminal proceedings under the anti-trust law.

The Government investigations of the bathtub trust had the effect of causing, almost immediately, the disruption of the combine by the seceding of a number of the largest manufacturers concerned. They returned to their original prices and carried on business again on a competitive basis. The legal prosecution was not, however, dropped on that account, particularly as the larger number of the companies were believed to be still under a working agreement. The officials of the companies concerned in the conspiracy made an effort through their attorneys to secure the consent of Attorney-General Wickersham to an agreement which would insure only the inflicting of a fine in consideration of a plea of guilty. This Attorney-General Wickersham, however, refused to do, holding that the officials would all be subject to criminal prosecution and the imposition of jail sentence.

Print Paper Trust—Attorney-General Wickersham has authorized a thorough investigation among news-print paper manufacturers, following a mass of evidence presented by the American Newspaper Publishers' Association. This evidence was accompanied, when presented to United States District-Attorney Wise, with a charge that a far-reaching conspiracy existed among paper manufacturers to throttle competition and operate under an agreement in restraint of trade. The manufacturers were accused of having made it impossible to maintain an open market or public quotation of paper prices; that paper manufacturers refused to sell paper for spot cash, f.o.b. mill; and that daily reports were gathered of production and sale of the paper mills throughout the country.

Evidence was also produced to show that a series of advances in the prices of paper had been made by different groups of the American Paper and Pulp Association following meetings of the members, at which price agreements were supposed to have been made.

In addition to the charges already enumerated, the American Newspaper Publishers' Association cited the refusal of many mills to sell other than 32-pound paper, the restrictions of contracts by many mills to one-year periods, the elaborate system for the collection of daily reports, "trade customs" adopted by paper makers and used by them as a basis for concerted action in regulating prices, the meetings of paper makers to discuss prices, and other changes which are stated to have taken place in the pursuit of the paper manufacturing business.

Failure of Cases against Standard Oil Company of Indiana—Cases against the Standard Oil Company of Indiana in the United States Circuit Court at Jackson, Tenn., with possible penalties of \$30,000,000, were dismissed 18 Nov. 1910, by Judge John E. McCall. After the prosecution had finished presenting its case, having been four years in bringing it to that point, Judge McCall ordered the jury to dismiss the case, with the following comment: "When the courts swing away from the rule of treating the rights of the great and small on the same footing and those convicted of crime are convicted by other means, the justice of our boasted jurisprudence will soon become a hollow mockery and the judgments of the courts will be held in derision and contempt."

The Government, in building up its case, had compiled records which weighed a total of 500 pounds. The suit was regarded as the most important litigation against the corporations which had been fought out in the South and had held public attention for four years. The chief allegation in the Government's case was that the Elkins law regarding interstate commerce had been violated by "scheme and device," the specific charge being the receipt of freight rate concessions. A portion of the testimony was outlined by Judge McCall to signify that the consignments which formed the basis of the suit were shipped on orders received from the Standard Oil Company of Kentucky by the defendant company from its refinery at Whiting, Ind., to Grand Junction, Tenn., "for beyond," with freight charges paid to Grand Junction and there taken possession of by the Kentucky corporation.

In substantiation of the view of the arrangement, Judge McCall said that the testimony presented tended to prove that there was no understanding, expressed or implied, direct or indirect, between the defendant company and the Kentucky company as the rates to be paid; that it was solely a business transaction between two corporations. As to shipments beyond Grand Junction, therefore, he ruled the Indiana company could not be held responsible.

"Blind billing" was made a feature of the case by the Government, which held that it was an effort to conceal the rate paid. This the court denied, deducing its result by reasoning from the evidence presented. The effect of this dismissal was to delay, possibly indefinitely, other similar suits against corporations in Tennessee.

Automobile Tire Trust.—An investigation was inaugurated in Oct. 1910, by the Department of Justice, to determine the truth of allegations that seven companies had combined to maintain prices and had blacklisted dealers who refused to comply with their dictates. The seven companies under investigation are The

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Diamond Rubber Company, capitalized at \$10,000,000, the B. F. Goodrich Company, capital, \$10,000,000, the Fisk Rubber Company, capital, \$4,000,000, Hartford Rubber Works Company; Continental Caoutchouc Company, G. & J. Tire Company, and Morgan & Wright. Of the seven companies four were alleged to be subsidiaries of the United States Rubber Company. In the trade it was learned that the seven companies were known as the "Big Seven," and they were generally accredited with controlling the prices of the trade. Dealers were found who had advertised cut prices and said that they had been unable to fill their future orders, having been blacklisted by the manufacturers. It was also alleged that prices were advanced 20 per cent at the same time that price-cutting dealers were being refused supplies.

Joseph Darling, a special agent of the Treasury Department, was assigned to secure evidence against the rubber trust in Dec. 1910. United States Senator Aldrich was instrumental in having the *ad valorem* duty on rubber raised at the special session of Congress which passed the Aldrich-Payne Tariff Bill, from 30 per cent to 35 per cent. He denied that he or any member of his family would profit by the raise, although members of his family are interested in a rubber company which deals in manufactured rubber.

Milk Trust.—The Milk Dealers' Association filed in Washington, 25 Oct. 1910, a mass of evidence tending to prove the existence of a New York-Chicago Milk Trust. A. S. Trundle, secretary of the Washington Milk Dealers' Association, undertook to assemble for Assistant Attorney-General Kenyon facts tending to prove that there had been held in New York, 25 June 1906, a meeting of the American Farm Products Company, an organization to control dairy products, chickens and eggs. After the first meeting of the stockholders, according to Trundle, the company was shown to have a common stock issue of \$15,000,000, \$2,000,000 of preferred stock, and \$2,000,000 of debenture bonds. Since that time, the Milk Dealers' Association maintains, the concern has been actively engaged in marketing and controlling milk, although not operating openly in that capacity.

Beef Trust.—In Jan. 1910, the United States Government began, under District Attorney Sims, in Chicago, a determined fight against the large combinations of packers, known as the Beef Trust. The particular corporation aimed at was the National Packing Company, which the Government prayed the court to dissolve as violating the Sherman Anti-Trust law. On 12 September, the indictments were returned by the Grand Jury, involving the most influential packers. Those indicted were J. Ogden Armour, president Armour & Co.; Lewis F. Swift, president Swift & Co.; Edward F. Swift, vice-president Swift & Co.; Edward Morris, president Morris & Co.; Edward Tilden, director Libby, McNeill, and Libby, F. A. Fowler, of Fowler Brothers; Charles H. Swift, director Swift & Co.; Arthur Meeker, general manager Armour & Co.; Louis H. Heyman, manager Morris & Co.; and Thomas J. Conners, superintendent Armour & Co.

The first indictment charged them with having a combination in restraint of the sale of fresh meats and purchase of live sheep, hogs,

and cattle. To do this, it was charged, bidding up of live stock was refrained from, prices were practically fixed under the so-called "request cost" of meats, any margin less than this "cost" being agreed upon by all concerned.

In practice, prices were maintained, the indictment charged, through the National Packing Company, which was used to secure valuable information on all the markets as to what branch house managers were doing, this information being sent to the Chicago office of the company, where it was accessible to the defendants, giving them an opportunity to fix prices for the following week. It was charged that officials met regularly in the offices of the National Packing Company. The second indictment charged a conspiracy, and the third charged that the defendants monopolized the trade in fresh meats by unlawful means.

In attempting to send individuals to jail, instead of securing fines against corporations, the Government changed its tactics in these cases.

On 14 Nov. 1910, however, the National Packing Company won the first point by being relieved of the necessity of producing its books. The Court of Errors in New Jersey reversed the order given in this respect by Supreme Justice Swayze. The decision had the effect of nullifying the efforts of the Government to cancel the charters of four packing companies, which the Government held they had forfeited by failure to comply with the court order. The Court of Errors confined itself to holding that no cause had been shown for producing the books.

Six large packing houses were found on investigation to receive a gross sum of \$945,000,000 a year for meat. This was by far the largest amount sold, the packers concerned being those prosecuted by the Government for conspiracy to maintain prices under the Sherman Anti-Trust law. The net annual profit of the six firms concerned was also set down as \$23,379,644.

Hard Coal Trust.—The United States Circuit Court for the Eastern District of Pennsylvania decided, 8 Dec. 1910, that the Temple Iron Company was a combination of anthracite coal carrying railroads in violation of the Sherman Anti-Trust law and granted the prayer of the Government for an injunction restraining the corporation from continuing a violation of the act. This, however, was only a partial victory, as the Government won only one of several cases, and was unable to affect the conditions regulating the prices of coal. The court held that there was no general conspiracy among the anthracite coal companies or the railroads which carried the coal, to restrain interstate commerce, monopolize the trade, or maintain certain prices. The suit was brought in 1907, under President Roosevelt's administration, the defendants including practically all the railroads which penetrate the hard-coal section of Eastern Pennsylvania.

Turpentine Trust.—The Circuit Court of Appeals, on 6 Dec. 1910, upheld the sentences imposed upon two officers of the turpentine trust, the case having the official designation, the United States vs. the American Naval Stores Company, National Transportation, and Terminal Company, Spencer F. Shotter, E. S. Nash, J. F. Cooper Myers, C. M. Boardman,

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C. J. DeLoach, and Carl Moller. Shotter is chairman of the board of directors of the American Naval Stores Company. He was sentenced to three months in jail and a fine of \$5,000. Myers, who is vice-president of the same concern, was sentenced to three months in jail and a fine of \$2,500. The turpentine trust operates throughout the South.

Tuberculosis. During the year 1909, there were 81,720 deaths from this disease, as against 78,289 in 1908. There was, therefore, an increase of 3,341 deaths during that year. Nevertheless, the figures of the Census Bureau of Statistics indicate that the death rate showed a decline of from 173.9 in 1908 to 167.5 per 100,000 population in 1909. The 1909 rate is the lowest on record for the census registration area, though it should be remembered that the rate for this area, to which large additions were made in 1906, 1908, and 1909, may not be strictly comparable throughout the period covered with respect to constitution of population. The addition of the new registration of Ohio for 1909, for example, by bringing in a considerable rural population with a normally low death rate from tuberculosis, would tend to depress the death rate from this cause for the registration area as a whole.

In the latest report issued by the Census Bureau, it is stated that, in the registration area of the United States, tuberculosis was responsible for 51.5 per cent of all deaths of printers, lithographers and pressmen, between the ages of 25 and 34 years of age. In agricultural districts, on the other hand, it was as low as 26.2 per cent, in the domestic and personal service class, 32.3 per cent; in the trade and transportation class, 31.9 per cent; and in the manufacturing and mechanical pursuits, 36.8 per cent. It will thus be seen that it kills more than a third of the employees in all these callings.

Treatment for tuberculosis has varied considerably, but there seems to be more or less uniformity of treatment at the present day. It is now well recognized that fresh air is the all-important feature; and patients are kept out of doors constantly all the year round, both day and night. Regular "camps" are being instituted in various parts of the country. The New York Throat, Nose and Lung Hospital recently opened a summer camp, well equipped for cases of this character; while in Montclair, N. J., steps are being taken to operate an open-air public school for children not in robust health. Public School No. 33, in New York City, has opened its out-door school for anæmic and convalescent patients, and in Boston the open-air school for tubercular children is being conducted along the most improved lines. Steps are also being taken in Philadelphia to open schools of a similar character; and all over the country great interest is being aroused in the movement. In France, also, the idea seems to be gaining fast; and at Lyons there is a large open-air school, under the direction of Professor Grancher.

The number of these open-air schools is rapidly increasing; there being now about a dozen of them in New York,—four of them being on river boats. The children in all cases are protected against the weather by means of warm blankets and hoods. They are given a warm meal in the middle of the day, and

crackers and milk in the middle of the morning and again in the afternoon. Nearly all the children taught in this way are sufferers from tuberculosis. One very interesting fact in this connection is that the children taught in this fashion learn faster than those taught indoors, although they have shorter hours, and other distractions. This shows the value of pure air upon the circulation of the blood, and indirectly upon the brain tissues. A very important part of the course is that the children are allowed to sleep as long as they like, and if they are not awake when the afternoon school is called, they are allowed to sleep on. In spite of this fact, however, they are found to progress faster than the children taught indoors.

Reports from the various fresh air schools have so far been very encouraging, and they are gaining wider and wider favor. Dr. Jay Perkins, in a recent paper read before the New England Association of School Superintendents, at Boston, said:

"It has been found that children with tuberculosis of the bones and of the glands (scrofula) are very amenable to treatment. Thus, the Sea Breeze Hospital at Coney Island has obtained excellent results in treating these conditions as found among the poor in New York. . . . Children having acute tuberculosis should never be permitted in the public schools. The fresh air schools of the present day are for any children physically below par, whether they have latent tuberculosis or not. The real relations of tuberculosis to the fresh air school should be that the wide-spread campaign against tuberculosis has given a stimulus for more rational methods of living and that the majority of physically imperfect children, and, in many instances, of apparently perfect children, are infected with tuberculosis. . . . The proper time to teach these things is during childhood. We should teach the next generation while they are still children, and we have a chance to, the essentials of hygiene and right living, as well as mathematics and English and an appreciation of the beautiful."

The idea is very prevalent—may, indeed, be said to be all but universal, that tuberculosis is a disease of the lungs exclusively; and that it can affect no other organ. Such, however, is not the case, and almost any part of the body can be attacked by the bacilli of tuberculosis. Thus, we may have tuberculosis of the bones, of the skin, of the intestines, etc. The tubercular products of the invasion of the body by the bacillus tuberculosis are regarded as primary and secondary, according as they are present at that part of the body which directly receives the organisms, or as they are dependent upon the transfer of the latter to parts remote from the region of their admission and immediate effects. This differing relation is also expressed by the terms local and general tuberculosis. In the former, the bacilli excite the growth of tubercle only at a given part of the body. Their apparent effects may be wholly limited to this region, and it not rarely happens that the same is quite distant from the channels through which the bacilli are admitted. A general tuberculosis occurs when the latter are disseminated over the body, and their effects, especially the production of numerous tubercles, are found at various parts. The scrofulous

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and lymphatic glands are particularly liable to become affected. The bacilli are found in the blood-vessels, thus proving their passage to every part of the body. Tuberculosis of the skin has frequently been noted—showing the direct communication between the respiratory centres and the cutaneous membranes and glands.

One of the most essential factors in the diet for consumption is the food-supply, which is most important. At present, it is generally agreed that a liberal diet of milk, eggs, butter, beef-juice, etc., is the best, and, while there are hygienists and food-experts who contend that such a diet is far from ideal, it is the one usually given in all cases of this disease, nevertheless. However, this diet is a very expensive one, and it is often next to impossible for the poor to obtain it. When five or six fresh eggs a day are required, as well as three or four quarts of milk, four to eight ounces of dairy butter, and twenty cents worth of meat for juice—these items alone would put them beyond the purse of the very poor, who are thus prevented by their modest incomes from receiving proper food. In New York, the daily rations, for raw material alone, would cost from 42 to 65 cents a day. But there is reason to think that this is excessive—both in the quantity of food allowed, and because cheaper bills-of-fare can be contrived. Recently, Miss Winifred Gibbs, food expert of the New York Society for Improving the Condition of Children of the Poor, stated that it is possible to provide a diet containing all the essential ingredients for as low as 25 cents a day; and if the food were bought on a wholesale plan, the cost should be reduced to 20 cents, or even lower. This is a very important factor, as we have seen, and it is earnestly to be hoped that those in authority will succeed in their efforts to furnish school lunches at the smallest minimum price.

One important announcement was recently made by Dr. William H. Park, of the New York Board of Health, regarding the transmissibility of infection from cows to human beings, as a result of drinking milk. As a result of extended experiments, Doctor Park asserted that there was no danger of contagion in this manner—at least for adults, though it was admitted that several infants had been infected in this manner. After conducting several hundred tests, it was found that the milk of tuberculous cows was not injurious to the health of anyone more than 16 years old; and seldom to anyone between the ages of 5 and 16. It was stated, however, that all the "crucial" experiments had been conducted with guinea pigs. Speaking of his experiments, Doctor Park said:

"We find that, with the methods now used in New York City, only about 9 per cent of those dying of tuberculosis in infancy, and very few above that age, have milk tuberculosis.

"Our report will be taken by the followers of Koch as tending to prove the great scientific assertion that bovine tuberculosis is not transmissible. I do not agree with Koch. To my mind the small percentage of bovine tuberculosis among babies under one year is due to the fact that the majority of the infants take milk from the parent, or from the bottle after the milk has been heated to pretty nearly the

boiling point. This serves to make the infant susceptible to human tuberculosis or to kill the bovine bacilli.

"It is my opinion that if all the children under the age of one year drank raw milk, the death rate from milk infection would be half the total death rate, instead of only 9 per cent. At present, about 10 per cent of the infants in the city die of tuberculosis. A great many deaths that are supposed to result from pneumonia and meningitis really result from tuberculosis. Our experiments, however, seem to show conclusively that there are scarcely any cases of milk tuberculosis among children over five or adults over 16 years of age. Adults may therefore drink any kind of raw milk with absolute impunity."

These conclusions are not accepted by every one, however, and it is not believed that, because adults die less frequently from milk tuberculosis, they therefore cannot be infected in this manner. It has been said—not without justification—that, because adults are "tougher" and less easily infected, it is quite unwarrantable to draw the conclusion that it is impossible for them to be infected in this way. That milk can impart tuberculosis is evidenced by the fact that infants are frequently infected; indeed, Doctor Park admits infection would total one-half of all deaths, if the milk were drunk "raw." This being so, it has been said that the incredibility increases as to adults not suffering, as Doctor Park asserts, as a result of drinking it. This is a question, however, which only future and greatly extended research will settle satisfactorily.

Attention of medical men has lately been drawn to a method of eradicating this dread disease, proposed by Dr. T. M. Haskins, of Wheeling, W. Va., and first put into practice by him. It consists in removing the infected portion of the lung or lungs by means of an operation. John Black, suffering from the disease, had heard of a case treated in this manner years before, and he himself requested the operation. His chest was opened, and the apex of one lung removed. In the former case, the patient died within two years of the operation; in the present instance, it is as yet too soon to tell what the result will be. Among physicians generally, no faith in this method of treatment exists. In the first place, it is doubted if the bacilli can be eradicated in this manner. But even if they could, there is strong reason for thinking that very few men could withstand such an operation, and recover—let alone patients suffering from tuberculosis. When the lung is cut into, in this manner, it nearly always collapses, and would probably do so in these cases also. The infected portion might be removed; but, as one physician said, at the time, "of what use is that if the patient dies?"

Within the past few months, however, another method of treatment for the disease has been suggested, which supplements instead of displacing the ordinary hygienic methods of open air, good food, and plenty of rest. This was suggested by Dr. Antonio Maggiorani, of Rome, who came to America in order to confer with a number of physicians here who had been combating the disease by the usual methods. He read a paper at Boston describing his system, the details of which, are, however, not as yet given. It is known to be a

species of inhalation, however; and by its aid it is stated that cures are often effected within two months; and many in from eight months to a year. Immunity seems also to be conferred upon the patient. The chief ingredients used by Doctor Maggiorani in the liquid which medicates the air inhaled by the consumptive are iodine, formaldehyde, and chloroform, used with atomizers and arsenical water. In conjunction, he also uses some hydro-electric therapy, which includes fomentations or baths, according to the condition of the patient.

The point raised by the Italian savant was that he doubted the value of the present-day treatments, which work only through the blood, arguing that since the bacilli themselves have no blood-vessels, remedies that come through the blood are not likely to affect them, while he has found that his medicated air kills them. As yet, no thorough trial of this treatment has been made in this country; and the older methods continue to meet with good results.

Red Cross, The Double.—The international emblem of the crusade against tuberculosis. This double red cross was first suggested, as the symbol of the International Anti-Tuberculosis Association, in Berlin in Oct. 1902, by Dr. G. Sersiron, of Paris, who became associate secretary of L'Association Centrale Française Contre la Tuberculose. Dr. Sersiron's proposal was adopted at the Berlin meeting and a movement was at once started to secure official recognition and protection for the double cross from European governments.

The double red cross is similar in shape to a cross used frequently in the Greek Catholic Churches, and also to the Lorraine cross of France. The National Association for the Study and Prevention of Tuberculosis in the United States has adopted the proportions of 9 for the length of the cross to 5 for the width of the arms, with a space one-ninth of the length between the arms.

In 1902, when the double Red Cross was adopted, there were not more than a half dozen associations for the prevention of tuberculosis organized on a wide basis. To-day, under the banner of anti-tuberculosis crusade, associations have been formed in almost every civilized country in the world. Even China is beginning to take action along this line, while in Turkey, India, Japan, the Philippines, South Africa, Australia, Iceland and in all the European countries active societies are at work.

In the United States, from four independent associations in 1902, the double red cross now enlists a carefully organized national movement under which are affiliated more than 30 State bodies and 420 local societies. If to these agencies are added the local, state and national governments enrolled in anti-tuberculosis work, the double red cross becomes the symbol of the greatest organized campaign for the prevention of disease that the world has ever known.

Tucker, Beverly Dandridge, coadjutor P. E. bishop of Southern Virginia, and 233d in succession in the American episcopate. b. Richmond, Va., 9 Nov. 1846. He received his education abroad in England and Switzerland, and later attended the University of Toronto, Can., and studied theology at the Alexandria, Va., Theological Seminary, where he was graduated in 1873. During the Civil War he served in the Virginia Artillery C. S. A., and

in 1873 was ordered deacon and advanced to the priesthood in 1875. He was rector of Protestant Episcopal Churches in Richmond county, Va., 1873-82, and of St. Paul's, Norfolk, Va., 1892-1906, and was elected coadjutor to the Rt. Rev. Alfred Magee Randolph (q.v.) bishop of the diocese of Southern Virginia. He was consecrated 3 Oct. 1906, by Bishops Randolph, Peterkin, and Gibson. The honorary degree of D.D. was conferred on him by Roanoke College. He is the author of several Confederate memorial verses and essays.

Tungsten. The production of tungsten in the United States has been on the decrease, during the past few years. Thus, in 1908, the domestic production of tungsten ore, reduced to an equivalent of ore carrying 60 per cent of tungstic trioxide, (WO₃), the ordinary commercial basis in the United States, was 671 short tons, valued at \$229,955, as against 1,640 tons, valued at \$890,048, in 1907. The statistics at present available from foreign countries show similar decline. Tungsten is used chiefly as an alloy for tool steel, to which it imparts the property of holding temper at a much higher temperature than high-carbon steels. It is especially valuable for lathe tools, since a much higher speed may be attained in work; and it is said that five times as much work may be done by a lathe, employing tungsten-steel tools, though this is denied in some quarters. It is generally believed that tungsten is used extensively in armor-plate for war vessels, but this is not the case, since the ability to resist sudden shock is not imparted to steel by tungsten. As the melting point of tungsten is very high—about 3,080°C—the metal is valuable for use as a filament in incandescent electric lamps, and such lamps are constantly coming into common use. "The whiteness of the light given by the tungsten filament," says the *Scientific American Supplement*, 29 Jan. 1910, "makes it much superior to that of carbon, and the efficiency of the tungsten lamp is more than twice as great as that of the carbon lamp. Thousands of filaments can be made from a pound of tungsten." Tungsten salts are used in fireproofing cloth for curtains, draperies, etc., in weighing silks, in glass-making, and for many other similar purposes.

Tunis. A petty kingdom in northern Africa, Africa, under control of France.

Area and Population.—The area of Tunis is about 50,000 square miles. This includes a portion of the Sahara Desert. The population is estimated at 2,000,000, the majority of whom are Bedouin Arabs. There are about 60,000 Jews in the country, and more than 34,600 French. At last census, the foreign population was put at 128,900, including 81,150 Italians, and 10,300 Anglo-Maltese. The capital town is Tunis, with 227,500 inhabitants.

Government and Finance.—The nominal sovereign is Sidi Mohamed en Nasr Bey, born in 1855. Prior to French occupation, the country gave allegiance to the Sultan of Turkey. The present Government is administered under a French Minister Resident-General, assisted by nine heads of departments, seven of whom are French and two Tunisian. For administrative purposes Tunis is divided into 13 districts, under district governors, who, in turn, are assisted by native functionaries. All the European powers have at various times recognized

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the right of France in Tunis. The revenue and expenditure for 1910 amounted to about \$9,440,000. The debt of the country approximates \$71,900,000. The Government contracted a loan in 1907 for railway construction, amounting to \$25,000,000, of which \$15,000,000 was guaranteed by France.

Religion, Education and Justice—The majority of the population is Mohammedan. There are about 35,000 Roman Catholics, among whom 25 of their clergymen officiate. There are members of the Greek Church, of the English Church, and of French Protestant bodies. At last report, there were 158 schools for public instruction, 21 private schools, and five lycees and colleges. Pupils totalled 22,350; 5,600 were French; 3,500 Mussulmans; 5,500 Jews, 5,850 Italians, etc. There are about 1,425 Mussulman primary schools assisted by Government appropriations. The Alawi college has a normal department, with 125 pupils, and a primary department with 450 pupils. The Carnot school for secondary instruction has an enrollment of 700 pupils. Justice in Tunis is administered in French tribunals, for Europeans, and between Europeans and natives, and in native courts for the adjustment of native differences. Police-court convictions, last returns, numbered 5,580, and about 2,300 persons were convicted in the courts of correction.

Production, Industry, and Trade—Agriculture is the most valuable industry of the country. The most recent available statistics place the production of wheat at 4,550 tons; barley, 4,450 tons, oats, 26,700 tons; the wine output at 2,200,090 gallons. Date palms, according to the same figures, numbered 1,350,000, and olive trees were grown on about 500,000 acres. Other products are almonds, oranges, lemons, shadocks, pistachios, alfalfa grass, and cork. Mines worked numbered 32, at last report. Copper, lead, zinc, etc., are mined. The live-stock industry is flourishing. Fisheries are valuable, sardines, anchovies, allaches, tunny fish, and other kinds being caught. There are spinning and weaving works; slipper, pottery, and matting manufactures; silk weaving factories; and tanneries. The trade as given in latest commercial reports is about as follows: Imports—iron, etc., \$2,575,000; machinery, \$2,045,000; flour, \$2,030,000; cotton goods, \$1,930,000; grain, \$1,890,000; coal, \$860,000; timber, \$680,000; sugar, \$600,000; tissues and wool, \$335,000; tobacco, \$270,000; and oil, \$215,000. Exports: olive oil, \$6,335,000; esparto grass, \$3,085,000; oats, \$850,000; zinc ore, \$840,000; copper ore, \$830,000; hides, \$830,000; cattle, \$290,000; wool, \$250,000; wheat, \$225,000; barley, \$150,000; lead ore, \$60,000; and phosphates, \$60,000. The 3 leading countries in Tunisian trade are France, Algeria and Great Britain.

Shipping, Railways, Telegraphs and Posts.—In 1908, 13,240 vessels entered at the ports of Tunis. Of a tonnage entered, 1,905,800 tons represented French trade; 1,422,795 tons Italian; and 299,680 British. In that year there were 665 miles of railway line in the country; 2,455 miles of telegraphs, operated through 173 offices; 120 telephone systems, with 3,000 miles of wire; and 384 postoffices, transmitting and receiving a total of 40,361,275 letters and other postal packets.

Tunnels. See SUBWAYS AND TUNNELS.

Turbine Engine. During the last few years, the American designers have built the largest turbines in the world. The day has passed when it was only the European who could design and construct first-class machinery to meet the most severe requirements. Some of the great turbines designed and constructed on this side of the water are the four 13,000 horsepower two-runner Francis turbines now operating in the plant of the Toronto Paper Company at Niagara Falls, and the four 9,000 horsepower, two-runner Francis turbines, installed in the Little Falls plant of the Washington Water Power Company. The head of the Toronto turbines is 133 feet, speed 250 revolutions per minute, quantity of water required per turbine 1,060 cubic feet per second, and of the Little Falls plant, head 66 feet, speed 150 revolutions per minute, quantity of water required per turbine 1,500 cubic feet per second. The highest powered turbines in the world have also been designed and built by Americans. One is the four 18,000 horse power single runner Francis turbine now operating in the power house of the Great Western Power Company on the Feather River at Oroville, California. Its ultimate head is 525 feet, speed 400 revolutions per minute, and when it is operated at wide open gate under the 525 foot head, each turbine is capable of developing 20,000 mechanical horse power. All this was the outcome of a new American School of design in that field. The circumstances creating it were the necessity of directly connecting turbines and making it necessary to predetermine the speed efficiency of the head and power. This required that each turbine be specially designed and that the design be completed before any construction was started. A turbine costs anywhere from \$5,000 to \$50,000, round numbers, hence it is too costly to be built as an experiment. Another reason for the new method was that high efficiency must be guaranteed and in many cases under a severe penalty for non-fulfillment. The material, workmanship and performance as well, must in most cases be guaranteed by the builder for a stated length of time from the date when the wheel is placed in commercial operation. It is also provided that the runners and guide vanes must be designed to withstand the severe conditions imposed by high heads without erosion. Prior to the construction of turbine wheels for the first great hydro-electric installations at Niagara Falls, the typical American turbine was made from stock patterns and listed after the manner of high speed steam engines. There were catalogues and price lists published by various manufacturers, which gave the power, speed and prices of the various runners of all sizes and shapes, having all conceivable combinations of inflow areas, discharge areas and vane curvatures. These runners were built by what is called the cut and try method. The inspiration of the designer would play a dominant part, then the runner would be tested in a testing flume. The result was seldom perfect at the start. The patterns for the runner would be changed in parts and the test repeated. This process was kept up until the runner was brought to a high standard of efficiency. Much of this work was done at the Holyoke Testing flume. In the evolution of turbine design in America, no factor played a more important part. Up to 1910, more than 1,800

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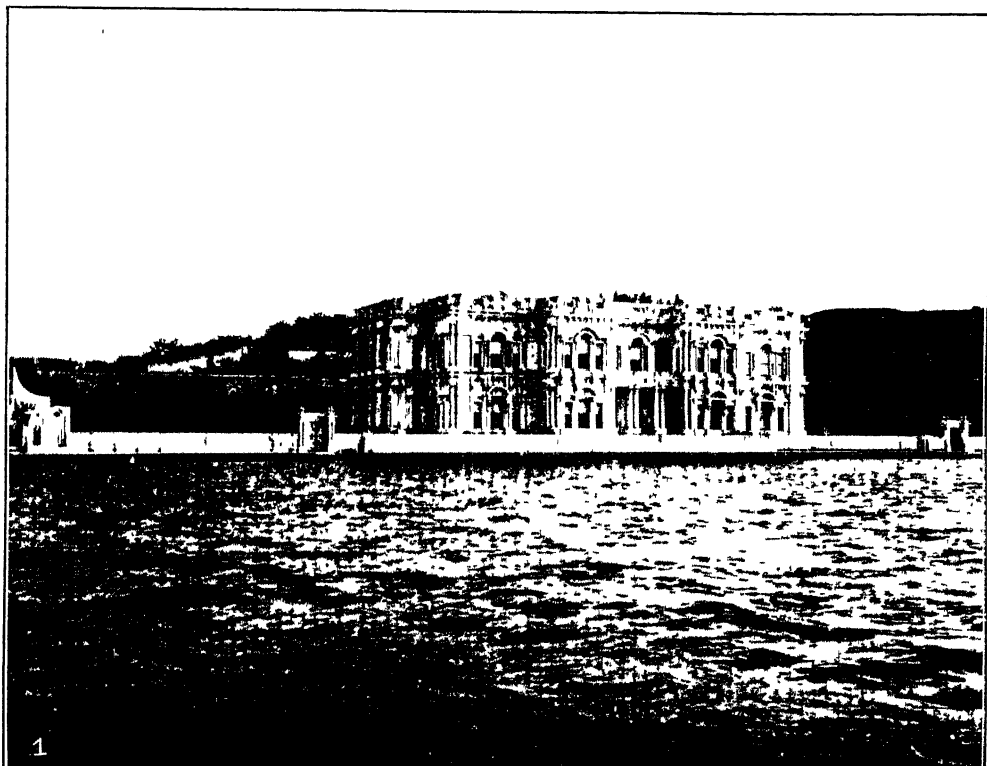
turbines have been tested there. The flume is best adapted to the testing of wheels that are from 27 to 42 inches in diameter, approximately. When the flume was built, the wheels were of a much lower capacity and it was not designed to handle the large volume of water discharged by high-speed wheels 45 inches in diameter or greater. The power of all wheels at the Holyoke flume is determined by friction brakes of which there are several sizes. The water is measured according to a Francis formula by a sharp crested weir of adjustable width. The width of the weir is adjusted according to the discharge of the wheel in order to bring the head on the weir within the limits of the experiments on which the Francis formula is based. These stock turbines have met the conditions for which they were intended and the market for them has grown. Their principal field of application is for heads under 100 feet and for capacities not exceeding 2,000 horse power. The stock turbine has an advantage over that made to order because there are no development charges and the resulting low first cost of the apparatus. The manufacturer can, in most cases, supply a standard machine which can be adapted to fulfill the conditions. Stock turbines as a class have experienced much trouble from erosion of the wheel vanes, especially when they have been applied to higher heads. Erosion is primarily dependent upon the design. The hydraulic design must be very close to perfection, in order to eliminate it, and the allowable variations from the standard should be very small. The turbines comprising the first great installation at Niagara were of foreign design but American manufacture. The latter then entered the field of building turbines to order, instead of merely keeping them in stock. An early one built was the four 2,000 horse power Fourneyron, outward flow, reaction turbines, for the Utica Gas and Electric Company to operate under head of 266 feet and run at a speed of 366 revolutions per minute. Another was the two 6,000 horse power, inward flow, Francis turbines, designed and built for the Shawinigan Water Power Company with a head, 125 feet, speed 180 revolutions per minute.

The steam turbine as a marine factor in vessels of slow normal speed is yet to arrive. The high initial cost and the inferior economy in steam is one reason. Another is that no promising scheme has yet been evolved having for its object the modification of the turbine or propeller so as to reduce the efficient speed of revolution of the former and increase that of the latter for vessels of 12 knots sea speed and under. The only approach to meet these conditions, if we except gearing propositions, has been in the combination system, where the turbine plays secondary part in the equipment, by utilizing the lower portion of the expansion of the steam between the low pressure cylinder of the reciprocating engine and the condenser. In the summer of 1909, the Turbinia Works Company decided to test turbines mechanically geared to the screw shaft of an existing typical slow speed vessel. For this purpose, *The Vespasian*, a cargo vessel, was purchased. Its propelling machinery now consists of two turbines in "series," viz, one high pressure and one low pressure, the high pressure turbine being placed on the starboard side of the vessel and the low pressure on the port. At

the end of each of the turbines there is a driving pinion, which is connected with a flexible coupling between the pinion shaft and the turbine, the pinion on each side of the vessel being geared into a wheel coupled to a propeller shaft. A reversing turbine is incorporated in the exhaust casing of the low pressure turbine. The air, circulating, feed and bilge pumps are of the usual design for tramp steamers and driven by means of a crank or connecting rod coupled to the forward end of the gear wheel shaft. The turbine and pinion shaft bearings under forced lubrication, similar to ordinary turbine practise. The teeth of the pinions and gear wheel are lubricated by means of a spray pipe extending the full width of the face of the wheel. Independent oil pumps are fitted for supplying oil to the bearings and the gear wheel with a view to the possibility of experimenting with different lubricants for the gear wheel, the oiling system for the bearings being separated from that of the gear wheel. The high pressure turbine is 3 feet maximum diameter by 13 feet over all length; and the low pressure, 3 feet 10 inches in diameter by 12 feet 6 inches in length. The turbines are designed similar to a land one, being balanced for steam thrust only, the propeller thrust being taken up by the ordinary thrust block of the horse shoe type, which is fitted aft of the gear wheel. A condenser together with a vacuum augments, was fitted with the turbine installation. The cooling surface of the condenser is 1,165 feet. The vessel was put to sea on four occasions. The results showed that under normal full-speed steaming conditions, there was an increase of about 1 knot obtained with the same coal consumption. The turbines and gearings have given no trouble and have worked satisfactory, with very little noise or vibration, throughout the trials. There is also no appreciable wear on the teeth or bearings. The complete and most satisfactory solution for slow speed vessels would appear to be by means of gearing, provided the losses in transmission, first cost and cost of maintenance are not too great. Many forms of gearing, mechanical, electrical and hydraulic, have been proposed or applied on a small scale. The first application of the helical spar gearing to drive a propeller was made by the Parsons Marine Steam Turbine Company. This was in 1897. The turbine was of 10 horse power geared to two wheels, each wheel driving a propeller shaft. The revolutions of the propeller were 1,400 per minute and the ratio of the gear 14 to 1. A turbine of the Parsons type with a reversing turbine on the same shaft was incorporated in the same casing. The gear was single helical. The turbine took part of the thrust of the propeller, the remaining thrust being taken on the thrust bearing in the gear casing. The air, circulating and oil pumps were driven by worm gearing off one of the screw shafts. The launch was 22 feet over all and attained a speed of 9 miles an hour. The helical and double helical gear of fine pitch, suited to high speeds of rotation, was first introduced by Doctor DeLaval of Stockholm, and has been extensively used in connection with his turbine for many years, with success and at moderate cost of maintenance.

Turkey. An empire occupying the peninsula known as Turkey in Europe, in the south-eastern part of that continent, and having as

TURKEY



1



2

1. The Palace of a Turkish Governor-General
2. Boating on one of the Rivers of Turkey

TURKEY

its dependencies Asia Minor, Crete, Cyprus, Samos, Armenia and Kurdistan, Mesopotamia, Syria, Arabia, and Egypt, Tripoli and Benghazi in Africa. It is sometimes known as the Ottoman Empire, from Othman, the founder, and dates from the year 1299.

Area and Population.—The area and population of the Empire, including States nominally subject, is as follows. Total area, 1,565,020 square miles; total population, 35,414,500.

The population in the European provinces under immediate Turkish rule is a mixture of all the races of Eastern Europe, except the Russians. Turks of the Finno-Tartar race, Greeks and Albanians are about equally numerous and form nearly 70 per cent of the population; there are also Serbs, Bulgarians, Rumanians, Armenians, Magyars, Gypsies, Jews and Circassians. Asiatic Turkey has a large Turkish population, with about 4,000,000 Arabs, numerous Kurds, Jews, and the races already mentioned. The population of the chief towns is as follows: Constantinople, 1,106,000; Salonika, 150,000; Adrianople, 70,000; Smyrna, 201,000; Bagdad, 145,000; Damascus, 200,000; Aleppo, 200,000; Beirut, 120,000; Brussa, 76,303; Kaisarieh, 72,000; Kerbela, 65,000; Mosul, 61,000; Mecca, 60,000; Barsa, 60,000; Medineh, 50,000; Homs, 70,000; Hama, 60,000; Konia, 60,000; Sivâs or Sebasteiz, 43,100; Jerusalem, 70,000; Jaffa, 45,000; Rodosto, 42,000; Gaza, 40,000; Erzerûm, 38,900; Bitlis, 38,800; Trebizond, 35,000; and Diarbekr, 34,000.

Government.—The reigning Sultan, Mohammed V, is the 35th in male descent of the house of Othman, and the 29th since the conquest of Constantinople. He was born 3 Nov 1844, son of Sultan Abdul Medjid, and succeeded to the throne on the deposition of his elder brother, Abdul Hamid II, 27 April 1909. The fundamental laws of the Empire are based on the precepts of the Koran; next to this come the laws of the Multeka, a code formed of the supposed sayings and doings of the Prophet, and the decisions of his immediate successors. Another code of laws, the Cahon nameh, formed by Solymán the Magnificent from a collection of decrees issued by him and his predecessors, is held important, but merely as an emanation of human authority. Forms of constitution have been drawn up from time to time since 1856, but until 1908 the rule of the Sultan was based on the precepts of the Koran. On 24 July 1908, an Imperial Iradé promulgated a constitution embracing an elective legislature. The Turkish Cabinet as reorganized 5 May 1909, consists of the following members: Grand Vizier; Ministers of Foreign Affairs and of Justice; President of the Council of State; Ministers of War, the Marine, Public Instruction, the Interior, Finance, Public Works and Commerce, Mines, Forests and Agriculture, and Pious Foundations; and the Sheik-ul-Islam. The empire is divided into Vilayets or Provinces, these into Sanjaks or minor provinces, these into Kazas or districts. A Vali or governor general appointed by the Sultan is placed at the head of each Vilayet. All subjects, however humble their origin, are eligible to the highest offices in the State.

The Harem is regarded as a permanent State institution, and all children born therein are considered legitimate and of equal lineage. The Sultan is succeeded by his eldest son, but only

in case there are no uncles or cousins of greater age.

Finance.—The Turkish Government publishes no financial accounts or estimates. When unable to meet its liabilities, it made an arrangement with its creditors, confirmed by the Iradé of Dec. 1881, and modified by that of 1 Sept. 1903. A Council of Administration at Constantinople was appointed, and received for distribution among the bondholders the funds derived from the excise duties, the Bulgarian, Eastern Rumanian and Cyprus tribute, and the tax on Persian tobacco. (In 1908 Bulgaria declared its independence of Turkey). The first official budget was published in March 1909. In 1909, by the Russo-Turkish agreement, Russia relinquished 40 out of 74 annuities of £T 350,000. (£T 1 = \$4.36). A loan of £T 7,000,000 was raised in that year. The budget for 1910-11 is as follows: Estimated revenue, £T 25,848,332; estimated expenditure, £T 30,270,246; Turkish debt, £T 104,108,156; sinking fund and interest, £T 3,232,567.

Of debts which are not loans, the most important is the balance of the Russian war indemnity. There is a debt of £T 273,494 for the Damascus railway.

Army.—See ARMIES OF THE WORLD.

Navy.—See NAVIES OF THE WORLD.

Education and Religion.—The prevailing religion in Turkey is Mohammedan, which claims the vast majority of the population of Asiatic Turkey, but only about half that of European Turkey. Nine non-Mohammedan creeds are recognized by the Turkish Government; Latins, Franks or Catholics who use the Roman Liturgy, and are descendants of the Genoese and Venetian settlers, or proselytes; Orthodox Greeks; Bulgarians under their Exarch at Constantinople; Armenians under their Patriarch at Constantinople, but under the supreme spiritual control of a Catholicos at Echmiadzin in the Russian Caucasus; Syrians and United Chaldeans under their Patriarch at Mosul; Maronites under their Patriarch at Kanobin in Mount Lebanon; Protestants, whose converts are chiefly Armenian; Jews; Nestorians or Assyrian Christians under the Patriarch Mar Shimun of Koghannes. These have the privilege of possessing their own ecclesiastical rule, and the Patriarchs, the Exarch, and the Chacham-Baschi or high-rabbi of the Jews possess, in consequence of this, considerable power and influence.

In Constantinople, about half the settled inhabitants are Mussulman. In the Turkish Islands in the Ægean Sea, the people number 296,800 Christians to 27,200 Mussulmans. The Mohammedan clergy are subordinate to the Sheik-ul-Islam; their offices are hereditary and they can only be removed by imperial iradé. The number of mosques in the Empire is 2,120, of which 379 are in Constantinople. The number of the clergy is 11,600. 1,780 elementary schools are connected with the mosques, where education is given free. Elementary education is nominally obligatory for boys from 6 to 11 years of age, and for girls from 6 to 10 years of age. The schools of various descriptions number about 36,230, and have about 1,331,200 pupils. There are various private schools and mission schools, an Imperial art school, a great National school (Greek), of old foundation, with 400 students, and a Greek theological seminary with 80 students.

TURKEY

Agriculture.—Turkey is an agricultural country, with a rich soil and considerable natural resources, but the methods employed are primitive. The chief products of Turkey in Europe are tobacco, cereals, cotton, figs, nuts, almonds, grapes, olives, all kinds of fruits, coffee, madder, gums and opium. Coffee is grown in the Hodeida region, and opium is an important crop in Konia. The tobacco crop in the Latakia district in 1909 amounted to 3,300,000 lbs. In 1908-9 wine was produced to the amount of 94,567,103 kilos, and spirits to the amount of 13,581,510; and 7,512,311 kilos of beer were brewed. There were 153,615 wine growers and 177,796 distillers. In the provinces of Brussa and Ismid 7,548 kilos of cocoons were produced, and 35,873 kilos of raw silk were consumed in local industries. Extensive mulberry plantations have been founded in various parts of the Empire, and 250,000 plants are annually distributed by the Government, which also encourages the production of oil of roses by supplying stocks of rose-plants. A feature of the agricultural development of Palestine is the presence of Jewish and German colonists; near Jaffa there are nine of the former with a total population of 5,000, cultivating about 15,000 acres. The colonies consist mainly of Russian Jews.

The Anatolian Railway Company in 1907 coöperated with the Turkish Government in the construction of irrigation works in Konia; a German firm will complete them in about five years, and it is hoped that thereby about 132,500 acres will be brought under cultivation.

In Tripoli barley and wheat are grown, also dates, olives, oranges and lemons, esparto grass and sponges are exported, and cattle and sheep are bred. Sponges are also a rather important product of the coast of the Mediterranean. The sheep of Kurdistan produce a wool which is especially suited to its uses of rug-making.

Exports and Imports.—The total imports in 1908 were 2,510,000,000 piastres, and the total exports 2,131,500,000 piastres. The chief imports are: Rice, sugar, flour, coffee, drugs, petroleum, timber, leather, hides, linen, woolen stuffs, cashmere and iron goods. The chief exports: Raw silk, cocoons, opium, barley, acorns, coffee, olive oil, figs, cotton, mohair, ores, carpets and eggs.

The imports and exports by countries show the trade with Great Britain, Austria, France, Italy, Russia and Germany to have been most important, in the order given, but the imports from Great Britain are usually more than double those of any other country save Austria.

Manufactures and Minerals.—The Turkish provinces, especially in Asiatic Turkey, are full of mineral wealth which is but little worked. Among the mineral products are chrome, silver, manganese, antimony, copper (the mine near Trebizond is said to be one of the largest in the world); borax, emery, asphalt, salt, gold, silver, mercury, kaolin, arsenic, iron, lithographic stones, and iron and argentiferous pyrites.

Brass-turning and copper work are important industries, but are carried on mainly in small shops or in the houses of the people, for the manufacture of articles for household use. The same is true of lace-making, weaving, embroideries and pottery. Concessions have been granted for glass manufactories, paper mills and textile looms. There are large spinning and weaving factories at Adana and Tarsus. At Damascus about 10,000 workmen are

employed in weaving silk, cotton and woolen fabrics on hand looms, this is one of the oldest industries of Turkey. The fisheries are important as a source of revenue, though the methods are antiquated. The Bosphorus fisheries alone yield some \$1,250,000 a year. Mother-of-pearl is found in the Red Sea and pearls in the Persian Gulf.

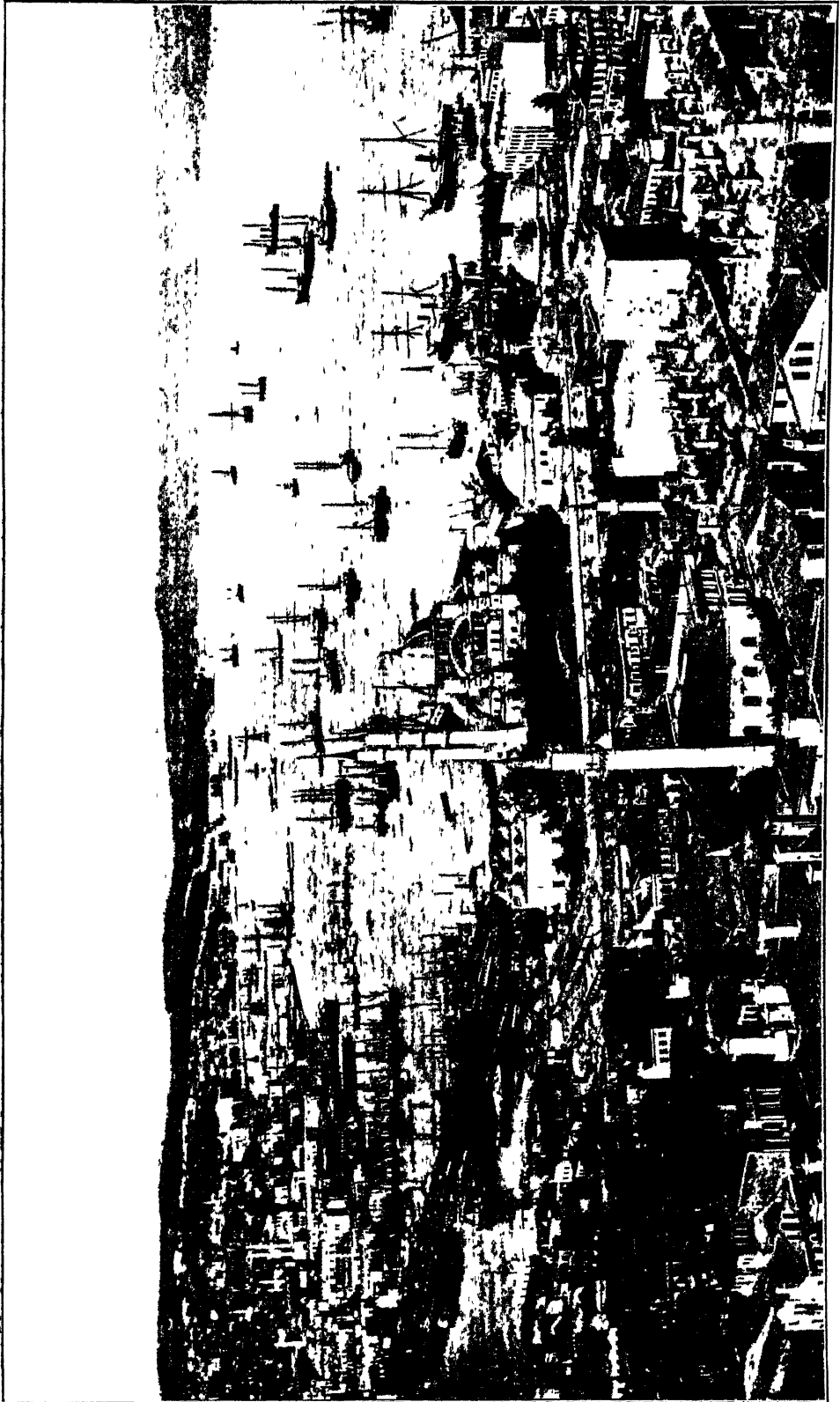
The shawls, rugs and carpets of the various provinces of Turkey have been famous from very ancient times, and are still, though the industry has been somewhat demoralized by the introduction of foreign dyes, which have displaced to some extent the vegetable dyes and other preparations which do not fade or injure the fabric, and whose secret, as sometimes happens, only one person knows. The genuine Turkish rug or carpet has a design especially suited for the use to which it is to be put, and every color is chosen to that end. Thus, a rug intended for the hearth would be so designed and colored that its hues would be brought out in full richness only by the light of flames, at that angle from which the light would fall from a hearth fire. Many of the designs also are symbolic, and some have been transmitted from generation to generation in one family. Armenian lace, a very delicate variety of needle-lace, is beginning to be known in this country. The genuine Turkish brasswork, though somewhat rare in this country, is as unique in its craftsmanship as the weaving, some of the carving of the brass is so delicate that it must be done under water.

An industry peculiar to certain provinces, of which Adana is one, is the manufacture of tahin from sesame seed, which is first soaked in brine, the kernels extracted, then the kernels are roasted and ground into pulp between stone rollers. The pulp is used in the preparation of a native confectionery called halva. The shipments taken to the United States in 1909 for the use of Greeks and Syrians in this country, were valued at \$11,423. Smyrna also produces a great deal of sesame seed of very fine quality. Cotton seed is an article of export, and olive oil is manufactured in Smyrna and elsewhere.

Communications.—The total length of railway in the Empire in 1909 was 4,075 miles, 1,239 miles being in Europe. The lines are Salonika-Monastir 136 miles, Constantinople-Salonika 317; Oriental Railways, 786, in Europe; in Asia the Haidar-Pasha-Angora, 358 miles; Eshki-Shekir-Konia, 283; Mudama-Brussa, 25, Smyrna-Cassaba, 165, Alasheir-Afion-Karahissar, 156; Smyrna-Aidin, 320; Konia-Eregli-Persian Gulf, 125; Mersina-Adana, 42, Beirut-Damascus, 96; Rayak-Aleppo, 295; Damascus-Medina, 812; Jaffa-Jerusalem, 54, and Haifa-Deran, 105.

The mercantile navy in 1909 consisted of 110 steamers of 69,440 tons, and 936 sailing vessels of 202,609 tons. In 1908 at Constantinople, there entered 14,700 vessels of an aggregate tonnage of 13,261,446 tons. The liners visiting that city are of German, Russian, Austrian, Italian, Turkish, French, Greek and Egyptian nationality, representing 12 navigation companies. There are projects on foot for the extension of the railways in various directions, to the total extent of over 6,000 miles in the Empire. Electric railways are under construction in and about Smyrna. There are 1,312 Turkish post-offices in the Empire, and foreign post-offices are maintained in most of the large coast towns by nations commercially interested.

TURKEY



CONSTANTINOPLE AND THE BOSPORUS

TURKEY

There are 28,890 miles of telegraph lines in Turkey.

Social Conditions—No statistics are available as to the conditions regarding crime and pauperism, and there is no government system for the relief of the latter. The beggars of Constantinople are as famous a feature of the city as the dogs, but the latter have recently been disposed of wholesale, being carried to an island and there practically exterminated. There is a considerable political party known as the Young Turks, which favors progress in various directions, the education of the people, and, to a certain extent, the foreign education of women. Many Turkish ladies are now educated in the European languages and in various other branches of culture. Travelers who have mingled with the Turkish soldiery report the standard of honesty, bravery and generosity among the Turks of pure blood as being very high. The general life of the people is still as distinctly Oriental as ever, and Occidental fashions, except in the matter of certain luxuries, do not make much headway in the Empire. The population of the Asiatic and African provinces is, of course, largely nomadic.

History, 1910—When the Young Turk party overthrew Abdul Hamid and forced him into retirement, they faced many serious problems in their attempt to rehabilitate the mistreated State. Conditions in every respect had become lax and in many instances deplorable. Their own party was also not without many faults characteristic of the nation, and the task of holding together the new government and forcing permanent reforms has been one of the most remarkable achievements in modern political activities. They did not meet with success in many respects and there was a period during the summer and fall of 1910 when the political outlook in Turkey was exceedingly grave, but the great bulk of the Turkish people proved that they were behind the Young Turk movement in its general policies, with the result that the close of the year saw the new movement more successful than at any time since its inception.

The chief trouble the Young Turk party encountered during 1910 was due to the activities of the Albanian people, who attempted to assert a national independence of thought and religion distasteful to the Moslem belief. In this respect the Albanians were only emulating the Bulgarians to the north and are, in fact, closely related to them. They are a hearty mountain agricultural people, one of the most intelligent in Eastern Europe, who joined with the Young Turks in the overthrow of Abdul Hamid. But as soon as they took advantage of what they considered their legitimate liberty of thought, the Government at Constantinople, believing it seemed an attempt to break from the Ottoman Empire, subjected the Albanians to treatment described as much more harsh than any that had been inflicted by Abdul Hamid. As the continuance of this treatment, in the face of strong opposition, threatened the downfall of the new government and establishment of a practical dictatorship, it assumed first place in the interest of Turkey.

The Albanians, who are a self-assertive, although kindly and hospitable people, made no secret of the fact that they regarded themselves practically as a separate nationality which remained under Turkish rule through sufferance.

When word of the activities in Albania reached Constantinople, Turgout Pasha, with 50,000 men, was sent into the mountainous country to re-establish the Turkish authority, which they did in the most cruel manner. The Albanians having been able to keep alive their national traits and customs through 500 years of Turkish rule, did not submit kindly to this move, and the open defiance with which the Turkish troops were greeted throughout the whole region, caused the inflicting of imprisonment and banishment upon the editors, school teachers and local authorities who rule absolutely within their own districts. The schools were also forcibly closed, the Albanian language suppressed, attacks and outrages were committed upon almost 5,000 peaceable citizens who were forced to submit to innumerable indignities, but the punishment which was most keenly felt was the refusal of the Turkish Government to permit the Albanians to use the alphabet adopted by them at the Congress at Monastir in 1908. The Albanians had endeavored to use the Latin, instead of the Arabic, characters in the histories and writings of the national authors, but the Young Turks, declaring the Latin alphabet of Jewish origin, insisted that the Arabic alphabet be used exclusively.

The Albanian students added to the bitterness of the Government by flooding Europe with circulars telling of the atrocities which were being practiced and calling for interference. They refrained from active measures on their own part, however, until Oct. 1910. Previous to that time there had been innumerable skirmishes between the Turkish troops and the militia of the country, which has been maintained through hundreds of years. But, on 8 October, a well defined rebellion became apparent at Scutari, which had probably been brewing for a number of months. Scutari lies in the heart of European Turkey, near the southeastern extremity of the Lake of Scutari, 45 miles east of Cattaro in Dalmatia. This territory has always been in a state of foment, and the last rebellion had not been put down six months by the dislodgment of the Albanian militiamen in the Kachanik Pass when the trouble broke out.

This was followed by a period of harshness practiced by the Turkish soldiers, not equalled for many years. Under the pretext of disarming Christians, they laid a heavy hand on all sections of the population which had been connected with former uprisings. Bulgarian and Greek Komatijis were the special objects of suspicion, and the peasants in the disaffected districts were beaten and tortured without investigation as to their activities. Many towns stood siege by the Turkish troops but were finally starved out. A country which had been used to the hard ways of oppression for many centuries found that it was receiving the harshest treatment it had ever been subjected to at the hands of the men it helped place in power.

A state of political excitement followed in Constantinople, but on 10 Dec. 1910 the Chamber of Deputies by a vote of 123 to 63 affirmed its confidence in the Government and settled all question as to its immediate future. Nevertheless, four days later, Dr. Riza Tewfik, a deputy, stirred the Turkish Chamber with an arraignment of the cruel treatment of the Albanians which showed that free speech had

TURKEY—TWO-SEED IN THE SPIRIT PREDESTINATION BAPTISTS

been thoroughly established in the Ottoman Empire. He declared that all non-Turkish elements had been eliminated. Ismail Haki, another deputy, followed and went into the Macedonian outrages in detail. Ahmed Riza, who presided, insisted that the deputies be given full power to express their criticism of the Government. The result of the arraignment was a less rigorous course among the Albanians, who were forced, at least temporarily, to forego their hopes of establishing a nationality of their own.

More serious than the criticism following the Albanian trouble was the difficulty encountered in the fall of 1910 to secure \$30,000,000 with which to extend military and naval operations. The Young Turks, finding themselves approaching once more the status of a first-class power, stretched their resources to the point where they were compelled to secure the loan with the customs receipts, an action Abdul Hamid had always refused to allow. The trouble over the \$30,000,000 proved to have sufficient foundation to disturb all the European Powers and the use of the money to mass Turkish troops against the Bulgarians and assume a more determined attitude against Greece did not please the Powers. The political leanings of the Young Turks were evidently towards the nations in the Triple Alliance and its position in relation to them was found to threaten the entente cordiale of Europe. Only vigorous action prevented a strained situation between Great Britain and France when Sir Ernest Cassell, the English banker, attempted to float the loan, after it had been refused by the French bankers. Suspecting that the Turks would spend the money buying arms and warships from Germany, France, which is Turkey's largest creditor, refused to take the loan in Sept. 1910, and it was not until 10 November that the loan was floated by a syndicate of German and Austrian bankers. Turkey already owed France \$500,000,000, which is 55 per cent of the entire national debt. The failure of the Grand Vizier to secure the loan in Paris resulted in the resignation of Djavid Bey, Minister of the Treasury, Mahmoud Shefket Pasha, Minister of War, and Talaat Bey, Minister of the Interior, the most conservative members of the ministry. It was impossible to secure the entire sum at once, on account of the financial stringency in Berlin and Vienna, but it was to be advanced as needed at 5½ per cent interest.

While the expenditures of the Young Turks aimed at the rehabilitation of the nation and increase in its power, they were not looked upon favorably by the French bankers, and there was evidence that the power given by the large loans would be felt in Turkey. The chief difficulty the Turks have encountered in respect to loans is the fact that the business houses and banks are almost entirely in the hands of the Armenians and Jews, and the shipping is controlled by the Greeks. The financial responsibility of Turkey under the Young Turks has not advanced as rapidly as was anticipated.

The chief advance in Turkey under the rule of the Young Turks has been in education. Although, even now, only 5 per cent of the boys and 1 per cent of the girls in the country attend schools, educational establishments have been conducted more recently in all the large towns

and are highly successful. Obligatory education was one of the first laws passed by the Young Turks. Even night schools were opened where instruction was free. Native contributors have established many schools. In Jerusalem, four young men, two Christian and two Mohammedans, opened a school which is very popular. Most of the children, however, attend the missionary schools.

A band of Bedouins, under the leadership of Chief Mejilla of El Kerak, in revenge for the slaying of a fellow Bedouin, attacked the Turkish garrison at Korak in the Turkish vilayet of Syria, on 9 Dec 1910, and killed more than 100 Christian inhabitants. The uprising then became serious and all the troops north of Maon were simultaneously attacked. Turkish railroad employes were also killed. The next attack was on El Kerank, a town of 2,000 inhabitants, 20 miles east of the Dead Sea, where the government officials and their families were all killed. A battalion of infantry was blockaded in the fortress. Turkish troops were hurried to the scene and ended the fighting by a decisive battle on 27 December, when 450 Bedouins were killed and 600 taken prisoners. The Turks lost seven officers and 76 men. A party of American tourists were robbed by a band of Bedouins during the progress of the insurrection, but were not physically injured.

The first attempt at a census of the Turkish Empire, begun in 1910, showed that it had many more inhabitants than had been reported. Under Abdul Hamid, local governors were in the habit of forwarding only a small portion of the taxes, and were able to keep the rest by making a false report of the number of inhabitants from whom collections were made. Djakeva, officially containing 21,000 inhabitants, has been found to have more than 80,000, and the whole European Turkey, instead of having only 6,000,000, has it is estimated a population of 12,000,000.

Turks and Caicos Islands. A part of the British West Indies, with an area of about 165 square miles, and a population of about 5,300. The town of Grand Turk (on an island of that name) is the seat of government, and has about 1,750 inhabitants. The Governor of Jamaica is supervisor of the affairs of the islands, which are in the immediate charge of six members of a Legislative Board, headed by a Commissioner, with a salary of \$3,000. The dependency has invested surplus balances amounting to about \$24,500. There are seven primary schools with an average attendance of about 600; government grant-in-aid, \$3,000. There is a public library at the capital. Salt is one of the greatest industries of the islands, 1,800,000 bushels being produced yearly. Other industries are sponge and fibre gathering. A cable connects the Turks and Caicos Islands with Jamaica.

Turpentine Trust. See TRUSTS.

Two-Seed in the Spirit Predestination Baptists. An evangelical Christian denomination, making prominent the doctrines of good and evil, Calvinistic, and holding to absolute reprobation and predestination. Organized by Daniel Parker, a Baptist minister in Tennessee from 1806 to 1836. Statistics for 1907 were:

TURKEY.



1. Turkish Soldiers

2 Turkish Sailors.

TYPHOID FEVER

Churches, 473; ministers, 300; membership, 15,851.

Typhoid Fever. From year to year the death rate from typhoid fever falls, as it becomes better understood, and measures taken to prevent it are more and more successful. Whenever unsanitary conditions prevail, there typhoid fever is sure to spread—as during the recent forest fires, when the homeless refugees, huddled together in camps devoid of sanitary conditions, developed typhoid among them. Here, as elsewhere, however, it was soon stamped out; and there can no longer be any doubt but that the disease is definitely under the control of medicine; and that it can never again assume the gigantic proportions it has in the past.

For some time it has been known that one attack of this disease renders the patient immune from other attacks. Anti-toxins had been searched for persistently, but until a short time ago without success. It is now believed, however, that a successful anti-toxin has been found, which will render the man inoculated as immune from typhoid as a previous attack of the disease. The experiments confirming this were carried out in the United States by Major F. R. Keefer, surgeon in charge at Fort Wadsworth, where the experiments were conducted.

More than 300 of the artillerymen were vaccinated during these experiments. The vaccinations were not compulsory; Doctor Keefer called for volunteers, and nearly every man responded to the call. About half the officers were "shot" also, as it was called. The report states: "Within a short time the anti-toxin began to manifest its presence. The symptoms were redness, slight soreness for about an inch around the point of the injections, accompanied by headache, backache, feverishness and nausea. These effects were so slight and brief, in the majority of cases, as not to interfere with the men's comfort. Cultures from the blood of several of the men were taken and subjected to scientific tests. It was found that the virus produced more 'antibodies' than the disease itself."

Ten days later the vaccination was repeated, with rather queer results in some cases. At the first injection, 500,000,000 killed germs were "shot" into each man's arm. This was doubled on the second occasion. Men who had previously only been mildly affected by the virus took it more decidedly the second time, and just the contrary resulted in other cases. The third and last injection proved the mildest of all.

Before this, various experiments had been conducted in other countries, with more or less success. Colonel Leishman, of the British Army, vaccinated a number of his men against typhoid fever, and, as a result of his experiments, furnished the following statistics: "Inoculated, 5,473; cases of typhoid fever, 21; deaths, 2, or, per thousand inoculated cases, 0.36. Non-inoculated, 6,610; cases of typhoid fever, 187; deaths, 26, or, per thousand non-inoculated cases 3.93." The observations of this group of 12,083 men cover a period of more than three years.

The doctors and nurses of the Massachusetts State Hospital have lately been inoculated against the germs of typhoid fever. The City Hospital has also gone through a very similar

operation—it being optional. The practice, in both cases, was along the lines laid down by Sir Almroth Wright, one of the foremost bacteriologists and inoculation experts in the world. The theory upon which such inoculations rest is easily enough understood. Roughly speaking, it may be said that enough dead fevergerms are injected into the blood of the patient to arouse to action, within him, the latent anti-toxin bodies that are in the blood of all healthy persons. Thus, the patient is said to be protected from the disease—and need not only be cured from it, when ill. The practice is asserted by some authorities to be of doubtful value, and there is, as yet, no complete agreement on this score. On the whole, however, it may be said that there is a considerable amount of evidence, tending to show that such a method of treatment is both beneficial and protective.

Typhoid is infectious as well as contagious. It enters the body through the alimentary system and attacks the intestines. Whatever tends to befoul the food supply, whether this comes directly from a source of contamination or indirectly through personal uncleanness, is very dangerous. When there is in the family of the neighborhood a person suffering from typhoid germs, given off by the body of that person may enter the water supply, the milk of the neighborhood, the food of the family. The hands that nurse the patient, for instance, may wash the dishes. In this and similar ways the disease is often transmitted.

One curious fact has been discovered in this connection, and that is that persons transmitting the disease may escape all contamination themselves. Metchnikoff has written about this at some length; and the famous case of "Typhoid Mary" is well known. She communicated the disease to all who came into contact with her, without contracting the disease herself. A similar case recently developed in Elizabeth, N. J. Some peculiarity within the body seems to render such persons quite immune from the disease.

Ice has been charged with carrying typhoid fever germs, and of being in many ways unhygienic. There is little reason to think that such is the case, however. Dr. Hibbert W. Hill, chief of the Bureau of Epidemiology of the Minnesota State Board of Health, studied this question, and came to the conclusion that very little danger is to be feared from this source. He said:

"It has been estimated that 250,000 people suffer from typhoid fever in the United States every year. For the last 20 years, during which sufficient attention has been paid to typhoid fever to elicit the source of outbreaks, 5,000,000 people have suffered. From this number 1-1,200 of 1 per cent have been attributed to natural ice,—all occurring on one outbreak.

"Ice was taken in one instance from a river actually producing typhoid at the time to the extent of 7 per cent of the community, yet the ice from that river did not produce a single case, and this history was repeated year after year. Natural ice, because of its great powers of purification, might be taken from the same water sources as produce typhoid fever, yet could not be held responsible for over 1-200 of 1 per cent of the total water-born typhoid."

Summing-up the result of recent experiments in vaccination, a recent editorial in the *Medical Record* says:

"Experience has shown that individuals can be vaccinated on the appearance of an epidemic or at any time during its course, and that the vaccination not only does not predispose to infection, but, if given during the incubation period, actually mitigates the severity of the disease. Indeed . . . it may be taken as pretty well proven that no (negative) phase exists. Since the introduction of vaccination in our army, there have been 135 cases of typhoid fever, among approximately 75,000 men, and only one of these was in a man who had been vaccinated."

The following are Major Russell's conclusions: "(1) Vaccination against typhoid undoubtedly protects to a very great extent against the disease; (2) it is an indispensable

adjunct to other methods of prophylaxis among troops exposed to infection, (3) it is doubtful if there is an increase of susceptibility following inoculation, (4) vaccination during the disease for therapeutic purposes fails to reveal any evidence of a negative phase, (5) the statement that vaccination should not be carried out in the presence of an epidemic is not justified by the facts in hand, (6) the procedure is easily carried out and only exceptionally does it produce severe general reactions. No untoward results have occurred in the above series of 3,640 vaccinations."

Unfortunately, no such progress can be recorded against *typhus* fever, and Dr. Howard T. Ricketts, of the United States Marine Hospital Corps, a bacteriologist of repute, fell a victim to the disease while studying it in Mexico City. So far, all efforts to discover the typhus germ have proved futile.

UCHIDA, Baron Yasuya, Japanese statesman b. 1866. At the age of 21 he became an attaché of the Japanese legation at Washington. In 1890 he returned to Japan, having received the appointment of personal secretary to Count Matsu, then minister of Agriculture and Commerce. In 1893 he was appointed Secretary of the Japanese legation at London, and from 1895 to 1897 served in a similar capacity at Pekin. In 1900 Baron Uchida was Vice-Minister of Foreign Affairs at Tokio, from 1901 to 1906 he was Japanese Minister at Pekin; from Feb. 1907 to Nov. 1910 he has been Japanese Diplomatic representative at Vienna, when he was appointed Japanese Ambassador to the United States, to succeed Baron Kogoro Takahira.

Uganda. A British Protectorate in East Africa, including native realms known as Buganda, Bunyoro, and Busoga. The area is about 117,680 square miles, and the population is estimated at over 2,000,000. The territory is under the administration of the East Africa Protectorate. The native king left Uganda in 1897, and made a great deal of trouble for the British, who finally, however, obtained control of affairs. Two years before the insurrection of Mwanga, the rebel, Britain had begun the construction of a railway to connect the colony with the coast at Mombasa. This line, called the "Uganda Railway," was completed in 1901; it is 585 miles in length, and controlled by the East-African British Government. A short railway (about 40 miles of line) is now under construction,—to touch the Nile. There are telegraphic, telephonic, and postal services throughout the colony. The local revenue for 1909-10 amounted respectively to \$825,000, and \$1,200,000. The leading imports into Uganda comprise cotton cloths, prints, groceries, etc. The exports from the colony consist chiefly of cotton, coffee, ivory, skins, chillies, rubber, and sim sim. The exportation of cotton in 1909-10 was valued at about \$295,000, showing an increase over previous years. The total value of the imports for 1909-10 was about \$2,015,000. Steamers and other craft on the lakes and waters of the interior carry a large amount of trade. See also under **BRITISH EAST AFRICA**.

Ultra-Microscope. The worker with the microscope has always been hindered by reason of the fact that it is impossible to perceive objects of less diameter than his glass is capable of magnifying. As years have passed, microscopes have been constantly improved, until now objects can be studied which are but a few thousandths of an inch in diameter, but beyond this it has been impossible to go. Just at the most vital and interesting point, when the ultimate constitution of matter, and more particularly of living matter, seemed about to be grasped, where it seemed possible that further magnification might render apparent some of the very processes of life itself, the chemist and the biologist have been brought to a halt, the ultimate limit of human ingenuity had been reached, the investigator was ever baffled by the limitations of his instrument.

Only lately, however, an important advance has been made. An instrument has been invented, called the "ultra-microscope," by means of which objects can be studied which are too small to be seen under the ordinary microscope, or directly by means of the human eye. This is a great and an important step, and already much work has been done in the study of colloids and protoplasm by means of the new instrument. A brief description of the apparatus is essential.

In the earlier methods of investigation, transmitted light was mostly used for the investigations, and the eye, dazzled by profusion of light, could not distinguish the slight differences of brilliancy caused by the diffraction of the light due to very small particles—just as it is impossible to see the stars by daylight.

In using the ultra-microscope, it is essential that the greatest possible illumination should be employed, and that the field of view should be as dark as possible. It is also essential that no jarring should shake the instrument and that the substance used should contain particles capable of being illuminated by the light passed through or upon it.

The light rays enter the darkened laboratory through an iris diaphragm, reflected from a heliostat. When the light rays have entered the telescope-objective, they are converged, and while they have a focal-length of about 10 mm., an image of the sun about 1 mm. in diameter

ULTRA-MICROSCOPE—ULTRA-VIOLET RAYS

is thrown upon a finely adjustable slit-head. This image can be reduced, if desired, to 5-50 hundredths of a millimeter. The width of the slit is shown on an indicator. The edges limiting the height of the slit are movable horizontally, and may be placed from 1-10 to 2 mm. apart. A polarizer may be placed behind the slit, when desired. Any side-light which may be reflected is shut off by the iris diaphragm. By means of another diaphragm, running half across the tube, one-half of the beam of light may be shut off—which may be necessary in making some examinations. A second telescope objective of 80 mm focal length forms a quarter size image of the slit, at the focal plane of the condenser. By means of the microscope objective, used as a condenser, the picture (reduced to one-ninth its size) is projected into the preparation. By means of two micrometer screws, working in a horizontal plane, and perpendicularly to each other, the condenser objective may be readily centered in the optical axis of the microscope proper.

In order to bring the desired part of a solid preparation into the axis of the illuminating beam, Diedentoph devised a metal prism having sides permitting a vertical micrometric motion of a little plane table.

The above arrangement is one adapted for the examination of fluids. For the examination of bacteria, another arrangement is necessary, somewhat different from the above. This will give a fair idea of the apparatus employed.

By means of this piece of apparatus, particles hitherto invisible in ordinary sunlight became capable of being studied; the size of particles in colloidal metal solutions e.g., has been determined. It has been shown that "in coarser hydrosols, the largest particles have a mass corresponding to a linear dimension of about 60-80 mm, but that carefully prepared solutions show an inhomogeneity which is scarcely discernible and hardly to be distinguished from that of many crystalloid solutions; further, that numerous intermediaries exist between these extreme cases." For a full and complete study of this important question, the reader is referred to R. Zsigmondy's book, 'Colloids and the Ultra-Microscope' (New York, 1909).

The smallness of the atoms which may be detected by means of this instrument will be apparent when it is stated that atoms or particles 1-4,000,000 inch in diameter may be seen by its aid, though not their shapes, color, or structure. The particles must also be separated from each other by as great a distance as 1-250,000 inch. The position and movement of such particles may, however, be seen.

Professor Rossonogow, of the University of Kieff, has lately applied this method to the study of electrolysis. The application of the current was followed instantly by the appearance, in the liquid, of very numerous bright points which moved toward the cathode with a velocity of the order of magnitude of the computed velocity of the ions of the electrolyte employed, while new bright points continually appeared at the anode. The direction of motion was reversed by reversing the current. The moving particles were deviated by a magnetic field, showing that they carried electric charges.

The ions are mostly densely congregated in a thin stratum of the electrolyte, the front of which was from 1-500 to 1-300 inch distant

from the opposing face of the cathode. This vacant space is analogous to the dark space of a Geissler tube and, like the latter, persists, no matter how greatly the electromotive force is increased. In the electrolysis of distilled water a second vacant space is observed, while copper sulphate solution and some other electrolytes exhibited phenomena which cannot yet be explained.

Ultra-Violet Rays. The peculiar properties possessed by the Ultra-Violet Rays are being discovered by degrees, and its wonders are being added to daily, as well as the list of its practical, beneficial influences. Milk is now being sterilized in Paris by submitting it to the action of these rays; the effects of which seem to be distinctly bactericidal. Water is also sterilized by this means, and an apparatus has been constructed in Paris which sterilizes 132 gallons of water an hour by this process. Milk, being much more opaque to the rays, can only be sterilized with some difficulty, however. Says the *Cosmos* (Paris) in a recent article:

"Pure water is easily traversed by the Ultra-Violet Rays. On the other hand, considerable difficulty has been found in applying the bactericidal action of these radiations to certain other liquids, which it has been possible to sterilize in this way only by acting upon them in very thin layers with quartz lamps. Mr. Gabriel Vallet has attempted to ascertain the rôle played by each one of a large variety of substances, in the absorption of the Ultra-Violet Rays.

"The source of light was a quartz mercury-vapor lamp. The liquids were first contaminated with an emulsion containing *Bacillus coli*, and then exposed for one minute at about one inch from the lamp, in a thickness of 1-16 inch . . ."

Among the numerous substances studied there are notable differences in regard to their penetrability by the rays. Some, such as ethylic alcohol, glycerin, and many saline solutions, are easily traversed; others, such as albumin, peptone and oil, are strongly opaque. Again, it is probable that when mixed to form a compound, they add their effects. This, at least, would seem to follow from the following demonstration: an artificial medium containing peptone, glucose, cream of tartar and water could not be sterilized under ordinary conditions, although each of the substances entering into its composition is quite far from the limit at which its solvent becomes opaque.

The famous French chemist, M. Becquerel, recently pointed out that the Ultra-Violet Rays destroy the spores of organic life, and so prevent the transmission of life from world to world, since inter-planetary space abounds in these rays. One of its most curious properties lies in the fact that it apparently causes metals to throw off clouds of tiny particles, as if by its impact it could shatter the surface-layer of the metal into minute grains of dust. This fact has been utilized by Professor Svedborg of the University of Upsala, Sweden, to produce what are known as colloidal solutions—mixtures of solid and liquid not quite so intimate as perfect solutions, like salt and water or sugar and water, and yet more intimate than when pulverized matter is simply floating or suspended in the liquid—like sawdust or sand and water.

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The peculiarity of these colloidal solutions is that the particles, when surveyed in an ultra-microscope (q v) are seen to be in rapid movement, and they so nearly approach the size of molecules that theories of the movements and numbers of molecules of substances have been deduced therefrom. In Professor Svvedborg's experiments the metal to be pulverized is placed in a flat vessel containing the solvent, and is exposed to a mercury vapor lamp. After a few minutes, the liquid can be observed through the microscope taking on the characteristic aspect of a colloidal solution.

Professor Svvedborg has extended his experiments on lead and silver, to water and to numerous other solvents, with very different results, so far as the size and number of particles are concerned. The preparation of solutions containing very uniform and excessively small particles having very lively "Brownian" movement, deserves special notice.

Further investigations along these lines may bring out the importance of the electric charge of the metal to be pulverized, and incidentally they may, perhaps, serve to elucidate the mechanism of photographic reactions.

It has only lately been ascertained that the Ultra-Violet Rays have a decidedly pathological effect upon the human tissues, just as the X-Rays were found, years ago, though a little different in their effects. An inflammation, known as electric ophthalmia, is often produced by even a brief exposure of the unprotected eye to Ultra-Violet Rays of very short wave lengths. As these rays are readily absorbed by ordinary glass, it is easy to protect the eyes against them; but they are very destructive to eyes wholly unprotected. The question has recently been asked, whether the Ultra Violet Rays of greater wave-length, which are not absorbed by ordinary glass, and which are much more abundant in the radiations emitted by electric lamps and incandescent gas mantles than in the light furnished by old-fashioned gas burners and kerosene lamps, may not also injure the eyes. Doctor Schanz, of Dresden, attributes opacity of the crystalline lens, and senile cataract, to the agency of these rays. As sunlight and diffuse daylight, to which the human eye has completely adapted itself, and which may, therefore, be regarded as the normal illumination, likewise contain the longer Ultra-Violet waves, the important question is, whether the eye receives such waves more abundantly from the modern powerful artificial sources of light, arranged in the usual way, than from daylight of equal illuminating power.

"Doctor Voegel, of Hamburg," (*Scientific American Supplement*, 17 Sept. 1910), "has proved by numerous comparative tests that Ultra-Violet Rays are far more abundant in daylight than in light of equal intensity furnished by incandescent electric and gas lamps and most electric arc lamps. An eye looking at an arc lamp receives fewer Ultra-Violet waves than it would receive from the rays of the sun reflected to it by a bit of polished metal at the same distance. Hence the modern powerful lamps are not injurious to the eye, if certain precautions, which are required for the visible as well as for the Ultra-Violet Rays, are observed. A powerful course of light should not be placed too near the eye, and an unnecessary intensity of illumination of the desk or work-

table should be avoided. The lamps should be so arranged and shaded that the dazzling source of incandescent light is not directly visible. The best method of illumination is the indirect system, in which the rays strike a white ceiling, and are thence irregularly reflected to the table, producing an illumination very similar to that of diffused daylight. Unshaded incandescent gas lamps should be enclosed in opal or ground glass globes. For work with arc lamps and other lights of great photographic intensity, spectacles made of glass which possess an especially great power of absorbing Ultra-Violet Rays should be employed."

A recent important series of experiments has been conducted by Professor Hasselbalch, in the Laboratory of the Finsen Institute, at Copenhagen. These were in reference to the action of light and Ultra-Violet Rays upon the red corpuscles and pigments of the blood. It had been found, previously, that the blood loses its power to imbibe and give off oxygen, under the influence of these rays. Starting from this point, Hasselbalch proceeded to determine the nature and conditions of this and analogous effects exerted by waves of short wave-length on certain derivatives of hemoglobin. He also studied the liquifying action of light on blood, and the action of certain photobiologic sensitizers on blood pigments and corpuscles.

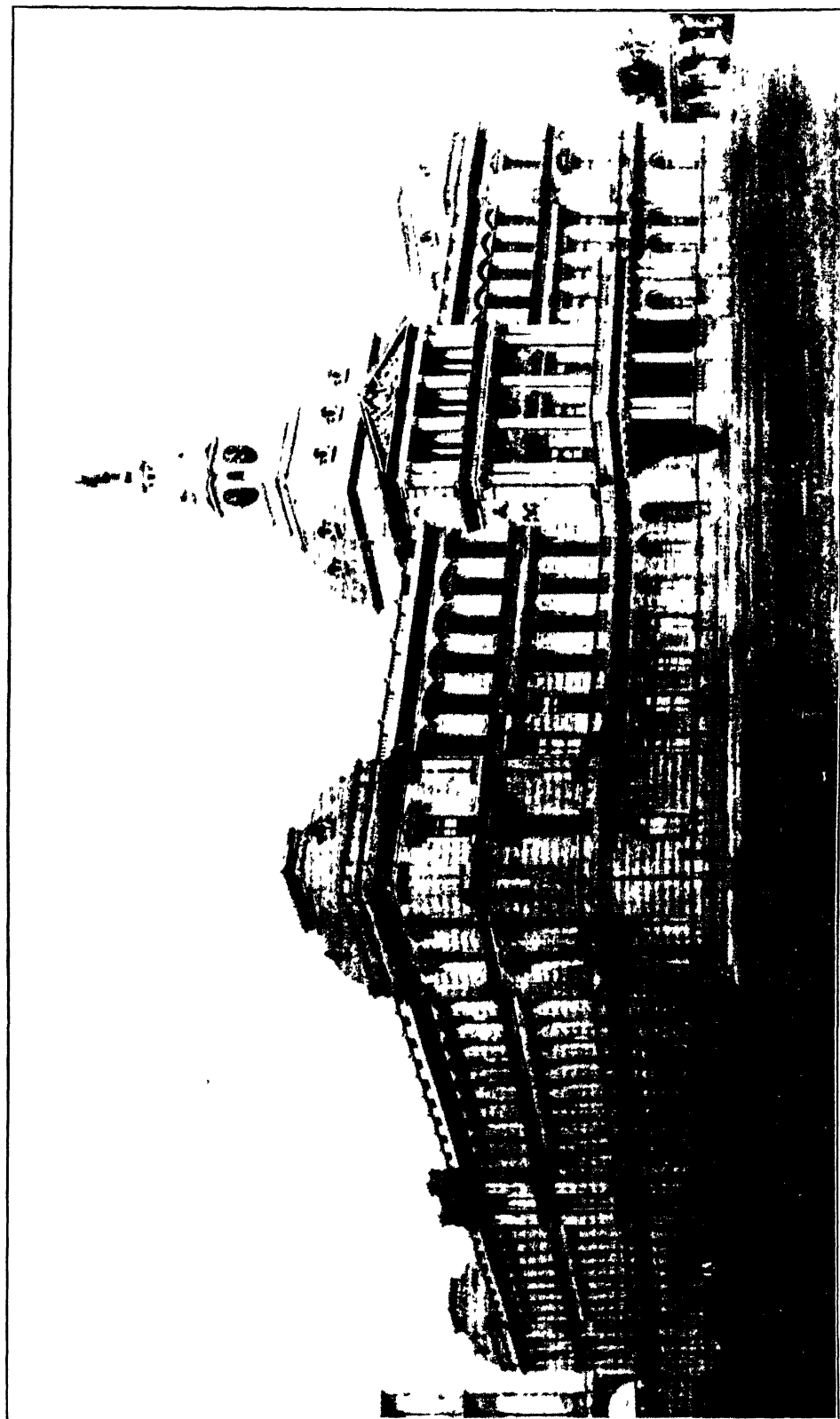
Fresh, defibrinated ox-blood was used for the experiments, the washed corpuscles being obtained from it. The source of radiation was a Kromayer mercury vapor lamp, operated with 36 amperes and 120 volts, which furnished rays of all wave lengths between 600 and 220 μ . (The visible spectrum extends approximately from 700 to 400 μ . The symbol μ denotes one millionth of a millimeter.) In some experiments, the extreme ultra-violet rays were cut off by placing before the quartz window of the lamp a plate of ordinary glass, or one of "Uviol" glass, which eliminated all waves shorter than 310 μ or 250 μ respectively.

Underwood, Oscar W., American lawyer and politician. b Louisville, Ky., in 1862. He was graduated from the law department of the University of Virginia, in 1884, and went to Birmingham, Ala., to practice. In 1894 he was elected to Congress, and has been reelected seven times. He is one of the best informed men in Congress on tariff questions, and is (1910) slated for the important post of chairman of the Ways and Means Committee in the 62d Congress.

Union of South Africa, The. The Union of South Africa became a certainty on 20 Sept 1909, by the South Africa Act, passed by the Parliament of the United Kingdom, by the terms of which the self-governing Colonies, Cape of Good Hope, Natal, the Transvaal, and Orange Free State, were united on 31 May 1910, these colonies becoming original provinces of the Union.

Area and Population.—The total area is nearly 470,000 square miles, and the total population 5,200,000, 1,120,000 being white. The area and population by provinces are as follows:

Province	Area	Population
Cape of Good Hope.....	276,995	2,409,804
Natal.....	543,913	1,206,386
Transvaal.....	110,425	1,347,227
Orange Free State.....	50,392	207,503



THE HOUSE OF PARLIAMENT, PRETORIA

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The Cape of Good Hope includes, besides Cape Colony proper (which has an area of about 200,000 square miles and more than half the total population of the province), East Griqualand, Tembuland, Transkei, Walfish Bay, Pondoland, and Bechuanaland, in which the population is largely colored. Natal includes Zululand, and the Orange Free State includes Basutoland. Provision is made for the admission of Rhodesia and for the transfer to the Union Government of the administration of protected and other native territories.

In the Cape Colony the white population is mainly British, 63,447 having been born in England or Wales, 15,709 in Scotland, and 8,605 in Ireland; and there were, in 1904, about 12,000 Russians. Of the colored population 15,682 are Malays and 298,334 a mixture of various races. Hindus have migrated to South Africa in considerable numbers since about the time of the South African War. The rest of the colored population belongs to the Hottentot, Fingo, Kafir, and other native races. Cape Town has a population of 91,973 with its suburbs; Kimberley, 34,331, and Port Elizabeth, 32,959. The births in 1908 numbered 60,524, and the deaths 33,967. The European birth-rate is about 31.78 per thousand, and the death-rate 10.28. The population of Cape Colony proper is 553,452 Europeans, and 936,239 colored. The population per square mile is 7.20, in some of the other districts it is much denser, being 69.64 in Transkei, which has 1,707 Europeans and 176,023 natives, in Pondoland the population per square mile is 51.75, in Tembuland, 56.22, and in East Griqualand, 29.32. All these districts are inhabited mainly by natives, who furnish the bulk of the labor employed on the farms and in mines. In Natal the European population has more than trebled in 30 years, and in 1908 was 91,443; Indians and Asiatics 116,179, and native 998,264. Durban has a population of 69,903, and Pietermaritzburg 31,230.

The Transvaal includes Swaziland, a district of 6,536 square miles. The population includes 86,584 persons born in Europe, nearly three-fourths of these being British, the total white population is 289,952, the Asiatic, 12,320; and the aboriginal, 1,021,656. The capital, Pretoria, has a white population of 21,161. Johannesburg is the largest town and the mining capital of the Witwatersrand gold fields, and has a population of 158,580, consisting of 83,902 whites, 62,524 aborigines, and 12,154 persons of other colored races. Eurasians form a not inconsiderable proportion of the people of the towns.

The Orange Free State has a population of 142,679 whites and 244,636 colored. The capital, Bloemfontein, has about 16,000 white inhabitants and 19,000 colored.

Rhodesia had a white population of about 18,000 in 1910, and a native population of 697,200. The political capital is Salisbury, 4,880 feet above sea level, the chief town of Mashonaland, and the white population is about 1,600. The commercial centre is Bulawayo, 4,469 feet above the sea, the chief town of Matabeleland, with a white population of 3,491.

Government.—The first parliament of United South Africa was opened 31 Oct. 1910, by the Duke of Connaught, brother of the late King Edward. The Governor-General, appointed by the Sovereign, is the Rt. Hon. Vis-

count Herbert Gladstone, and the members of the Executive Council are chosen and summoned by him. Departments of State are established by him and he appoints not more than 10 officers to administer them. There is a Senate consisting of 40 members, and for 10 years after the establishment of the Union eight of these are nominated by the Governor-General and eight elected for each Province. The House of Assembly consists of 121 elected members, 51 of whom represent the Cape of Good Hope, 17 Natal, 36 the Transvaal, and 17 the Orange Free State. Members of both Houses must be British subjects of European descent. This provision is significant in that it grows out of the problem of governing the aborigines, which is one of the important problems confronting the Union. The white population, comparatively small, is scattered in towns and farms across a territory greater than that of Germany and Austria combined. In this, much of the territory of the veldt resembles districts in our own Southern States in which the negro population is large. But there is an additional complication, in the fact that in many of the districts, where the native population is greatest, it consists of, or is allied with, fighting tribes who are aware of their own strength, and some of whom have a primitive system of government of their own. The British Government is thus confronted with a situation combining the difficulties of our race problem with those of its own race problem in India. It is not unlike the situation which would exist if our Southern States had an Indian instead of a negro population, if this population were four times that of the whites, and if the whole North were inhabited by the Indian tribes which inhabited it before Columbus. Training in the arts and trades of civilization is constantly received by African native boys who, in case of an uprising, would join with their own tribes. Hitherto, British rule in South Africa has taken the line of giving the fullest possible self-government to such native tribes as were capable of it, within their own territory, on the same basis as it allows native princes and chiefs to rule in India under British control. Herein British policy has been distinctly at variance with Dutch, the rule of the Boer making the aborigines as nearly slaves as might be. It remains to be seen how these two policies will coalesce in meeting the issues of actual government.

In the Provincial Councils the restrictions as to European descent does not apply.

The seat of the government is Pretoria and that of the Legislature, Cape Town. The Premier and Minister of Agriculture is Gen. Louis Botha. The other Ministers are Railways and Harbors; Interior and Mines and Defence; Justice; Education; Finance; Lands, Native Affairs; Commerce and Industries; Public Works and Posts and Telegraphy; and one Minister without Portfolio.

Finance.—The revenue in 1908 was \$79,514,465, the debt, \$523,333,325. Railways, ports, harbors and customs are administered by Union Commissioners. The difference in the customs duties, with the inconveniences of the revenue service between the provinces, was one of the reasons leading to the formation of the Union.

Agriculture.—South Africa is essentially an agricultural country, although the mines are a

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great source of wealth. The bulk of the people, however, must inevitably for a long time to come be occupied in farming, and the immense possibilities of the country are only just beginning to be realized. The Dutch are making great progress in the methods of their farming, and in certain industries the output has increased enormously.

Cape Colony produces wine and grain in the southwestern part, and in the southeast, tobacco and maize, while the table-land between the two ranges of mountains, known as the Great Karroo, supports vast flocks of sheep and many cattle and horses. The important industry of ostrich-farming is also carried on here; in 1904, 389,051 pounds of ostrich feathers were produced, with a value of \$5,294,940. Another product of importance is mohair; Angora hair was exported, in 1908, to the value of \$3,113,610. The grains raised are wheat, oats, barley, mealies (maize), Kafir corn and rye. In 1904 there were 1,954,390 cattle, 419,963 horses and mules, 11,818,829 sheep, 7,162,463 goats, 385,945 pigs, and 357,970 ostriches. The sheep-farms are from 3,000 to 15,000 acres and upwards.

The Natal, in 1908, about 390,000 acres were under cultivation by Europeans, and the chief crops exported were sugar, tea, maize and wattle bark. Cotton cultivation and fruit-growing have been introduced and are progressing, and other crops raised are beans, potatoes, Kafir corn, turnips and beets, lucerne, sweet potatoes, peas, pumpkins and vegetables. There were, in 1908, 220,413 cattle, 68,427 goats, 765,377 sheep, 32,177 horses, and 25,677 pigs. At Durban a whaling industry has been established.

The Transvaal is primarily a stock-raising country, the horses, in 1904, numbered 52,168, the cattle, 546,829; sheep, 844,214; and pigs, 157,888.

In the Orange Free State the Government has been establishing experimental farms and encouraging farming, stock raising, and forestry in every way. In 1907 there were 155,530 acres under wheat and 1,543 acres under tobacco. The live stock numbered: horses, 127,579; cattle, 585,077; sheep, 8,020,308; pigs, 62,439. Ostrich farming is also carried on. The eastern part is especially adapted to grain cultivation.

Rhodesia has a subtropical climate, but the altitude makes it suitable for fruit-growing, and tobacco, rubber, cotton and all kinds of grain are indigenous.

Education and Religion.—The educational system is subject to the difficulties usually attending the establishment of schools in a thinly settled, pastoral country, with a small European population. The Province of the Cape of Good Hope had, in 1909, 3,681 schools, attended by 172,225 children. There are five colleges, with 842 students, and a university; the expenditure for education in 1908 was \$2,892,640. Education is not compulsory. Nearly half the European population can not read or write. The division of the population, according to religion is as follows: 399,487 Dutch Reformed; 281,433 Church of England; 88,653 Presbyterian; 112,202 Independent; 277,285 Wesleyan; 12,947 other Methodists; 37,041 Lutheran; 23,079 Moravian; 20,782 Rhenish Mission; 14,105 Baptist; 37,069 Roman Catholic; 22,623 Mohammedan; 19,537 Jewish; 1,015,760 of no religion, four-fifths of these being natives.

In Natal there are more than 100 Government-aided schools of various grades, besides 164 Government-aided farmhouse schools for European children, 26 Indian schools, 168 native schools, and 19 colored schools, which receive government aid, and a number of private schools, especially schools for girls, in Durban and elsewhere. About 3,300 children attend private unaided schools, and it is estimated that only a small percentage of the white children are receiving no education. Several scholarships have been established by the Government and by private foundation. The total attendance at the Government-aided schools for natives is 14,056, and the attendance at Government-aided schools for the children of Indians, 2,411. The majority of the European population belongs to the English Church.

The Transvaal has seven high schools with an attendance of 1,069; 134 town and village schools with attendance 21,876; 466 farm schools with 14,269 pupils; seven State-aided schools with 103; and 10 colored schools with 1,114, there are about 220 native schools with about 11,000 pupils. The native language of the pupil is the medium of instruction in the early years of school life, and in the upper standards English will predominate, even where the children are Dutch. Here, as in the Orange Free State, the majority of the people belong to the Dutch Reformed Church. In the Orange Free State there are 400 Government or Government-aided schools with enrollment of 19,000; fees are charged at all schools. English and Dutch are taught to all children. Grey University College at Bloemfontein has 60 students, and the Grey College School, a boarding school for boys, has 250. A Government boarding and day school for girls has about 200. There are also Catholic and Protestant private schools for girls. There is a Normal School where 30 to 40 teachers are trained each year, and technical instruction in industries is here given. This was established soon after the war. In 1909, \$857,500 was spent on education.

Exports and Imports.—The exports from Cape Colony in 1908 include wool, diamonds, raw gold. The chief exports from Natal are coal, wool, and bar gold from overland. The Transvaal exports gold, diamonds and wool. The annual export of diamonds from the Orange Free State amounts to nearly \$4,000,000.

Mining and Manufactures.—The output of the Kimberley mines in Cape Colony in 1908 was \$13,425,750 of diamonds; gold is found in the Knysna division, manganese in the Paarl, and there are important mines of copper in Namaqualand, the ore yielding a percentage of from 32 to 36. Coal is also mined.

Natal has mines of various sorts; asbestos, copper ore, fireclay, gold, graphite, gypsum, iron ore, lead and silver ore, limestone, marble, manganese, mica, molybdenum, nickel ore, nitre, oil shale and tin are known to exist here, and the phosphate deposits are likely to develop an important industry. There is a considerable export trade in coal.

The Transvaal produced, in 1909, 7,299,413 fine ounces of gold; 3,623,656 tons of coal; and 1,877,486 carats of diamonds with a value of \$5,883,400. In 1909, 229,015 persons were employed in the Transvaal mines, of whom 21,814 were whites, 10,527 Chinese, and 196,674 African natives. The Transvaal has iron and

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1. Missionaries Baptizing a Kaffir Child
2. The Inhabitants of a Kraal taking part in a Wedding Dance

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brass foundries and engineering works, grain mills, breweries, brick and tile works, tobacco factories and various other industries. The importation of Chinese for labor in the mines was stopped in Dec 1905.

In the Orange Free State there are indications of gold, and rich coal mines exist; diamonds, garnets and other precious stones are found. The value of the chief products of the mines in 1908 was: coal, \$628,135, diamonds, \$5,349,610; salt, \$160,000, the total value of the mining output in 1908-09 was \$5,956,670.

Communications.—Cape Colony has 935 miles of railway open, the receipts for 1908 were \$9,164,310, and the expenditure, \$6,201,595. The Transvaal has 2,627 miles of railway, Natal, 976, and the Orange Free State, 2,364. These statistics are for 1908, and some railway construction has been going on in all the States since that time. In the Orange Free State six new bridges of masonry, with 85 feet span, have been erected over the Bloem Spruit, which has been straightened to avoid a repetition of the flood of 1904. The Central South African Railways include the lines of the late Netherlands-South African Railway, the Orange Free State Government Railways, and the Pretoria-Pietersburg Railway. The railways in Cape Colony are mostly the property of the Union Government.

The "Cape to Cairo" railway scheme places Capetown in communication with Buluwayo, Salisbury, Beira, the Victoria Falls, and Broken Hill. From Cape Town there is cable communication with Europe via the West Coast; via St. Helena and overland; and a direct line to Australia via Natal.

There are five harbors at Table Bay, (Cape Town), Port Elizabeth, East London, and Mossel Bay. Durban (or Port Natal) is the only harbor of importance on the southeast coast. Capetown is 5,979 miles from Southampton; transit, 16 days. There are electric tramways in Capetown, Port Elizabeth, East London. Natal has telephonic communication between the principal towns and with Johannesburg. There are telephone systems in all the principal towns of South Africa.

Social Conditions.—No extended statistics are available regarding crime and pauperism. The Cape Colony had, in 1908, 715 convictions before the special J. P. Courts, 55,746 in Magistrates' Courts, and 749 in Superior Courts; the number of prisoners in jail at the beginning of 1909 was 2,749 males, 398 females. The Cape mounted police numbered 767; the ordinary and urban police forces, 1,492, and the jail establishment, 654. In the various charitable institutions of this colony, in 1909, there were 5,629 inmates; and in 1908, 16,544 patients were treated in the hospitals. There is no recognized system of poor law relief, but during 1908 indoor relief was given to 1,341 persons, and 3,465 received outdoor relief.

The Transvaal produces more gold than any other country in the world—about one-third of the entire gold production of the world; and the gold production is increasing. This wealth, however, with those who benefit by it, mostly goes out of the country, while the mining population tends by its instability and general character to be rather a demoralizing and burdensome element. The real wealth

of the country is pastoral and agricultural, and every effort is being made by the British Government to encourage settlers, teach improved methods of agriculture and stock raising, and by the founding of schools and the better policing of thinly settled districts, to induce desirable settlers to come and develop the land.

Kruger developed among the Dutch population a national spirit and solidarity of feeling which tends now to spread progressive ideas. After the war the English Government aided Boer farmers to rebuild their barns and restock their farms, and, in the schools established in the conservative Dutch districts, care has been taken to have the children taught at first in Dutch, not in English, and thus to avoid the enmity which would come from any attempt to stamp out the ancestral language.

By the union, the Transvaal, while losing something in the taxes which come of its mining wealth, gains quicker and better transportation through the united railway lines. And, finally, the union of all the provinces in common interests and purposes would make them all stronger against a possible war with the aboriginal tribes which have, since the very beginning of the settlement of South Africa, menaced the Dutch, and not seldom nearly wiped out their settlements. The Dutch, while in the majority among the people of the South African Union, were not insensible to the advantage of having England's resources of all kinds at their service, and General Botha, the present Premier, has done more, perhaps, than any other one man to bring about the union.

A minor result of the new arrangement has been some confusion in the English postoffice, as the initials of Union of South Africa are U. S. A., and letters directed in that way to any address in the United States now stand some chance of going astray.

The imports to South Africa at present include most of the necessities of civilized life, and the trade is naturally with the United Kingdom more than with this country, but it is not at all impossible that, with a little enterprise on the part of American manufacturers, these States may become a valuable market for the United States. The American miners in the Rand are there in considerable numbers, but, from present indications, the people who will find most money in South Africa will be those who go there to stay, and grow up with the agricultural part of the country. It is a land in the making.

Unitarian Church. A religious organization founded on the fatherhood of God and the brotherhood of man, permitting the utmost freedom of thought to its membership. The administrative body, the American Unitarian Association, with headquarters at Boston, publishes a large amount of denominational literature which is circulated all over the country through conferences, unions, alliances and leagues. In 1910 there were 461 churches, 541 ministers, and about 70,000 members. Eight academies and three theological schools are maintained in its educational department. The organizations of the denomination include the National Conference of Unitarians and Other Christian Churches, the Unitarian Sunday School Society, the Young People's Religious Union, local clubs, and ministerial associations. The Uni-

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tarian Church of Hungary has a membership of 80,000, and in Great Britain there are nearly four hundred societies. Missionary work is actively prosecuted among the Swedish, Norwegian, and Icelandic immigrants in the United States.

United States. The total area of the United States, including non-contiguous territories and insular possessions, is 3,743,344 square miles, according to the last estimate of the United States Coast and Geodetic Survey. It is divided as follows: United States, 3,026,789; Alaska, 590,884; Philippine Islands, 115,026; Hawaiian Islands, 6,449; Guam, 210; Tutuila Island, 77; Porto Rico, 3,435; Panama Canal Zone, 474.

Population—According to the Thirteenth Census, taken during 1910, the population of the United States, exclusive of non-contiguous territories, is 91,972,267; including the total area of enumeration, 93,402,151. For details of the 1910 Census, see APPENDIX, SUMMARY OF THE UNITED STATES CENSUS, for a comparative statement of the growth of the United States, see CENSUS, UNITED STATES.

Agriculture—For a general discussion of agricultural conditions in the United States and statistics showing the growth of the industry, see the articles AGRICULTURE, AGRICULTURAL EXPERIMENT STATIONS, DRY FARMING, IRRIGATION, etc., and the articles appearing under the headings of the separate products, BARLEY, CORN, WHEAT, etc.

Industries—Articles describing the industrial development of the United States will be found under the headings of the several industries, COTTON, COTTONSEED, ELECTRICAL INDUSTRIES, IRON AND STEEL, RAILROADS, SHIPPING, etc. The facts regarding the industries and manufacturing interest of the various States are given in the article under the heading of each State. For a general description of the growth of industries, see INDUSTRIES, AMERICAN, STATE OF. For information relating to industrial combinations, see the article TRUSTS; for matter about labor questions see LABOR, LABOR ARBITRATION, and LABOR EVENTS IN 1910.

Administration—For facts relating to the administrative work of the United States Government see the articles on the separate departments under the heading UNITED STATES, as UNITED STATES ARMY, UNITED STATES CABINET, UNITED STATES CONGRESS, UNITED STATES NAVY, etc.

United States Army. During 1911, pressure will be brought to bear on Congress for the passage of measures that will increase the engineering corps and for additional officers of the line. Many of the promotions especially to the grade of general, which President Taft made during the year, were officers serving in the War Department and on the General Staff. This policy has been criticised by military authorities, first, because it is unfair to allow the General Staff a monopoly in promotions, and secondly, it is not the best policy to promote men engaged in bureau work and not in active relationship with their troops. Much of this criticism was reflected in Congress, where a measure decreasing the General Staff was introduced and nearly passed. Great efficiency can only be maintained, according to military critics, by having the officers in active command

of their men, rather than doing department work at Washington. The army in active service consists of 15 regiments of cavalry, 765 officers, and 12,775 enlisted men; 6 regiments of field artillery, 236 officers and 5,220 enlisted men, a coast artillery corps of 170 companies, 672 officers and 19,321 enlisted men; 30 regiments of infantry, 1,530 officers and 25,231 enlisted men; 3 battalions of engineers and 2,002 enlisted men, commanded by officers detailed from the engineer corps; the Porto Rico regiment of infantry, 32 officers and 576 enlisted men, staff corps, school service detachments, Military Academy, Indian scouts, recruits, etc., 11,777 enlisted men; and a provisional force of 52 companies of native scouts in the Philippines, 180 officers and 5,732 enlisted men. The total number of enlisted officers, staff and line, on the active list is 4,453 (including 193 first lieutenants Medical Reserve Corps on active duty); and the total enlisted strength, staff and line, is 76,911, exclusive of the provisional force and hospital corps. Under the law, the strength of the army at any one time cannot exceed 100,000. It is organized under acts of Congress of 2 Feb 1901, 25 Jan 1907, and 23 April 1908. The chief of staff, who is head, is Major-General Leonard Wood. Major-General William H. Carter and Brigadier-General Arthur Murray are members of the staff. The commissioned and organized militia numbers 121,580. The unorganized, composed of males between 18 and 45, numbers 15,493,125. For the fiscal year ended 30 June 1910, the desertions from the enlisted force amounted to 3,464, or 3.66 per cent of the total number. This is a decrease from 1909, when the percentage of desertions was 4.97. Much interest was aroused during 1910 by the publication of several magazine articles in which the writer undertook to explain conditions in the army as the cause of these desertions. His charges have been denied by the military authorities. There was no brigadier advanced to the major-generalship since William H. Carter reached the rank in 1909. Four colonels and one lieutenant-colonel were appointed brigadier-generals during the past year. Of the promotions, that of Lieutenant-Colonel H. M. Chittenden was for the purpose of retirement and Brigadier-General Walter Howe, another appointee, has left the active service. Many promotions were made in the Medical Corps during 1910. This was due to the large number of retirements and also on account of the enlargement measure. The officials in the adjutant general's, inspector general's, judge advocate general's, subsistence and pay departments were not advanced. The General Staff has undertaken to eliminate those officers that at present are of no value to the service. For this purpose, a retiring board has been created which, at the present writing, is giving consideration to the cases of six officers. The War Department is very anxious to secure legislation which will require majors and lieutenant-colonels to take examinations for promotions, and, further, that the examination boards be obliged to disregard all favoritism in their work. There are three Civil War veterans among the 21 general officers, Generals Earl D. Thomas, Charles L. Hodges and Daniel H. Brush. Five officers who participated in the Mexican War are still on the retired list. But two of the present 21 general officers held

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higher rank than that of captain at the outbreak of the Spanish War. During 1910, 224 officers were appointed to the army. Of this number, 110 came from civil life, 83 were commissioned after graduating from the Military Academy, 10 were former Midshipmen in the navy and 16 formerly served in the ranks. Five from civil life were honor graduates from educational institutions, with military training, 51 were physicians who were made first lieutenants in the medical corps, and two clergymen that were appointed chaplains. The ages of the cavalry officers for 1910 were higher than those in other branches of service. There was a decrease during the year in the number of trials of officers by courts-martial. But 23 appeared before this body, exclusive of those whose cases were unfinished at the close of 1909. Of officers tried in 1910, two were colonels, one lieutenant-colonel, one major, five captains, eleven first lieutenants, one second lieutenant; and a chaplain was tried twice. Seven were charged with neglect of duty, one for disobedience of orders, five for misbehavior, one for embezzlement, one for falsification of ordnance stores, one for drunkenness, one for intoxication, one for disrespect toward the commanding officer, three for absence without leave, and the charge against one officer was not published. Three officers were dismissed from service, one reduced 25 files in grade, one, 20 files, four acquitted, three reprimanded and one confined to his post and fined \$100. During 1910, the active list of the army lost 102 officers by deaths, resignations, retirements, dismissals, and charges. Of this number, 40 were West Point men, while 33 came from civil life. As an offset, 83 men graduated from the Military Academy and received their commissions. The retirements number 63, the smallest since 1904, of which eight were brigadier-generals, 14 colonels, nine lieutenant-colonels, 10 majors, seven captains, 13 first lieutenants, one second-lieutenant, and one chaplain. Disability caused 31 to leave the active service. The retired list of officers for 1910 numbers 1,011, as against 1,003 for 1909 and 979 for 1908. Col. Joseph W. Duncan, 6th Infantry and General Staff, has been appointed the successor of Brigadier-General Walter Howe who retired under the age limit in the latter part of Dec. 1910. Col. Walter S. Schuyler of the 5th Cavalry will succeed General Thomas to the rank of brigadier-general. Colonel Duncan was in active service against the Indians in the West, served in Cuba and later went to the Philippines. He will not reach the age limit until 1917. Colonel Schuyler is a lineal descendant of Major-General Philip Schuyler and has served as second-lieutenant, first lieutenant and captain in the 5th cavalry which he now commands. He graduated from West Point in 1870. The two oldest line majors in the army are Henry L. Ripley, 8th Cavalry, and Feilder M. M. Beall, 28th Infantry. The former is 63 and the latter 62. The oldest West Point graduate on the retired list is Brigadier-General Horatio G. Gibson. He came from the class of 1847, served in the Mexican War, then fought against the Indians in Oregon in 1851 and 1855, and, later on, enlisted in the Civil War where he received four brevets for his gallant services. The oldest living graduate of West Point is Gen. Simon B. Buckner, of Kentucky, who was born

in 1823 and entered the Academy in 1840. He also fought in the Mexican War and, later, in the Confederate army. There are nine Military Departments of the army in the United States, and three in the Philippines. The commander of the latter is Major-General J. Franklin Bell, with General Potts in command of the department of Luzon, General Brush of the Visayas and General Pershing, of Mindanao. Major-General Frederick D. Grant, commands the Department of the East, which includes Porto Rico and the islands and keys adjacent thereto, General Tasker H. Bliss, the Department of California, Brigadier-General C. L. Hodges, the Department of the Lakes, and Brigadier-General A. L. Mills, the Department of the Gulf.

A confidential report from the Secretary of War, in which the United States was represented as unprepared for war, was sent to Congress in Dec. 1910. In the report, the regular army was described as deficient in number and arms, poorly equipped, ill organized, and too widely scattered. The militia was characterized as similarly deficient and further weakened by physical faults. It was declared that an enemy could sweep both coasts. The report said in part: "So far as regards the regular army, this force is deficient in numbers and defective in the following respects: (1) it lacks proper proportions of all arms and certain staff corps; (2) it lacks reserves of field guns, ammunition, and supplies necessary to its operation in the field, which cannot be readily procured when war breaks out; (3) it is so widely scattered throughout the country and its possessions as to render impossible that rapid concentration for war purposes which is essential in modern military operations; (4) it is not organized into the higher units, brigades and divisions, which are essential for purposes of war and which cannot be created with the necessary promptitude when war is imminent or has been declared." According to the report, 785,500 troops are not adequate to withstand invasion. Of mobile troops we need 900,000 to defend our coasts, the number at present available being 114,500 leaving a deficiency of 785,500. Of coast artillery troops we need 49,814 to man coast defenses, the number at present available being 20,400, leaving a deficiency of 29,414. "In order that the deficiencies in our defenses may be corrected," concludes the report, "and the safety of the nation assured, it is suggested that there be established by the Congress a permanent Council of National Defense, to be composed of members of the legislative and executive branches of the government, upon whom joint responsibility in this matter rests, to determine a general policy of national defense and to recommend to the Congress and to the President from time to time such measures relating to the national defense as it shall deem necessary and expedient."

United States Bureau of Mines. See MINES, UNITED STATES BUREAU OF.

United States Cabinet. The Cabinet of the United States is at present composed of the following men: Secretary of State: Philander C. Knox, of Pennsylvania; Secretary of the Treasury: Franklin MacVeagh, of Illinois; Secretary of War: Jacob M. Dickinson, of

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Tennessee; Secretary of the Navy: George Von L. Meyer, of Massachusetts; Secretary of the Interior: Richard A. Ballinger, of Washington; Secretary of Agriculture, James Wilson, of Iowa; Secretary of Commerce and Labor: Charles Nagel, of Missouri; Attorney-General: Charles W. Wickersham, of New York, Postmaster-General: Frank H. Hitchcock, of Massachusetts. Each member of the Presidential Cabinet receives a salary of \$12,000 a year, with the exception of the Secretary of State, who, until 4 March 1911, receives only \$8,000. This exception is allowed to stand solely in order that Secretary Knox may continue to fill the office. After he had accepted President Taft's appointment to the position of Secretary of State it was discovered that a constitutional provision barred him from the office. During the period when Secretary Knox was a Senator from Pennsylvania the salary of the Secretary of State had been advanced from \$8,000 to \$12,000. The provision in question stipulated that no Senator or Representative should accept an office the emoluments in connection with which had been increased during his term in Congress. A bill was promptly presented to the Senate when this provision was discovered, by which the salary of the Secretary of State was again reduced to \$8,000 until the date before mentioned. After many complications had been smoothed out this bill was successfully passed, and Mr. Knox permitted to take his seat in the Cabinet.

United States Census. See CENSUS, UNITED STATES and APPENDIX; CENSUS SUMMARY.

United States Coinage. The mints of the United States during the year 1909 coined 2,988,707 double eagles, with a value of \$59,774,140; 598,753 eagles, with a value of \$5,987,530; 4,382,098 half eagles with a value of \$21,910,490; and 441,899 quarter eagles having a value of \$1,104,747; making a total gold coinage of 8,411,457 pieces with an aggregate value of \$88,776,907. The total number of silver pieces coined during the same year was 35,982,350, with an aggregate value of \$8,087,852.50. This sum was made up of 5,058,050 half dollars, 16,442,650 quarter dollars, and 14,481,650 dimes. The total number of minor coins minted in 1909 was 129,276,789, of which 11,590,526 were five-cent pieces and 117,686,263 pennies; making a minor coin aggregate value of \$1,756,388.93. The number of coins of all kinds minted in the United States during 1909 was thus 173,670,506, amounting to an aggregate value of \$98,621,148.93. From the time of the establishment of the United States mints in 1792 up to the end of the fiscal year, 30 June 1910, the mints had turned out a total of 266,291,942 gold pieces, with a value of \$3,149,207,670.50; a total of 2,116,677,008 silver pieces, with a value of \$963,406,087.95; and a total of 2,944,063,098 minor coins, with a value of \$56,184,332.67. This makes the total coinage of the United States up to 30 June 1910 amount to 5,327,032,048 coins, which represent an aggregate value of \$4,168,798,091.12.

United States Commerce Court. On 18 June 1910, Congress passed "An act to create a Commerce Court and to amend 'An act to regulate commerce, approved February 4, 1887, as heretofore amended, and for other purposes.'" The new court now has jurisdiction

formerly possessed by Circuit Courts of the United States over (1) all cases for the enforcement, other than by adjudication and collection of a forfeiture or penalty or by infliction of criminal punishment, of any order of the Interstate Commerce Commission other than for the payment of money, (2) cases brought to enjoin, annul, set aside, or suspend in whole or in part any order of the Interstate Commerce Commission, (3) such cases as by section three of the act entitled "An act to further regulate commerce with foreign nations and among the States," approved 19 Feb. 1903, are authorized to be maintained in a Circuit Court of the United States, and (4) all such mandamus proceedings as under the provisions of section 20 or section 23 of the act entitled "An act to regulate commerce," approved 4 Feb. 1887, as amended, are authorized to be maintained in a Circuit Court of the United States. The jurisdiction of the Commerce Court in cases of the above four classes is exclusive, but does not extend to cases of types not enumerated above, which, as formerly, come under the jurisdiction of either the Circuit or District Court. The Commerce Court is a court of record, made up of five judges appointed by the Chief Justice of the United States from among the circuit judges of the United States and, in the first instance, of five additional judges appointed by the President of the United States for terms of one, two, three, four, and five years, respectively. The judges appointed by the Chief Justice serve for the full term of five years. The Commerce Court is permanently open, its regular sessions being held at Washington, D. C., although it may hold sessions in different parts of the United States as is found to be desirable. Its jurisdiction may be invoked by the filing of written petitions setting forth the petitioner's cause of action and specifying the relief sought, while appeals may be taken from its decisions to the Supreme Court of the United States. Judge Knapp is the present Chief Justice of the Commerce Court.

United States Congress, Acts of the Second Session of the Sixty-First. The second session of the 61st Congress, which extended from 6 Dec. 1909 to 25 June 1910, was one of remarkable legislative activity. Only twice before in recent years has its output of laws been equalled. Among the most important laws passed during the session was one by which the Interstate Commerce law of 1906 was so amended as to greatly extend its scope; a law which established the Court of Commerce (q. v.), a new Federal court to consider cases arising under this new Interstate Commerce law; a law admitting New Mexico and Arizona to statehood; a law which calls for a public accounting of contributions and expenditures in Federal elections; and laws (1) authorizing withdrawals of public lands from settlement for conservation purposes; (2) advancing funds for the prosecution of reclamation enterprises in arid sections; (3) instituting a Federal Bureau of Mines (q. v.); (4) enlarging the activities of the Federal tariff board, and (5) providing for the regulation of the so-called "white slave traffic." During the same session, an investigation of the Pinchot-Ballinger controversy was authorized, while the House of Representatives furnished the most sensational legislative development of years by so amending the

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House rules as to exclude the Speaker of the House from membership on the Committee on Rules, of which he had previously been chairman. This resolution placed a decided curb on the excessive powers formerly enjoyed by that officer and brought about the overthrow of what has been popularly known as "Cannonism." The session also made appropriations for two new battleships of 27,000 tons each, armed with 14-inch guns, together with six torpedo boat destroyers, two colliers, and four submarines. Other important appropriations were for the raising of the battleship *Maine*, which has so long lain in Havana harbor, for enforcing the Sherman antitrust law, for extending the activities of the tariff board, and for preserving the nation's water supply. Although 27,000 bills were introduced into the House of Representatives during the session and more than 9,000 in the Senate, among the more important measures which did not reach passage were those having to do with ship subsidies, anti-injunction, new forms of government in Alaska and the Panama Canal Zone, a national bureau of health, a model insurance law for the District of Columbia, increased postal rates for second class matter, the Appalachian forest reserve question, and an increase in the engineer corps of the army.

United States Consular Service. One of the earliest actions which Philander Knox undertook, upon assuming the duties of Secretary of the State, was the reorganization of the Consular Service of the United States. This had long been regarded as a system of rewarding the politically faithful, and little evidence of ability was necessary to be shown by the mere holding of consular office. This state of affairs Secretary Knox set about changing. He made efficiency, integrity and ability the price of promotion rather than friendship or fidelity, and insisted that vacant consular offices be filled by promotion, whenever possible and practicable, instead of from outside sources. State circles did not fully realize how determined Secretary Knox was in this until he drove his sincerity home with the appointment of James L. Griffiths, of Illinois, a man of marked ability but of little general prominence, to the office of Consul-General to London, one of the most important posts in the entire consular service of the country. The new consular appointments which came in 1909 with the new administration were all made on this basis, and the result will be a more efficient and competent consular service for this country. Altogether about 140 new consular appointments were made during the year, the majority of these, however, being in comparatively unimportant positions. A new consul-general at large, for South America, Central America, the West Indies and Caracao, was appointed in the person of Charles C. Eberhardt, of Kansas. Among the other important appointments made during 1910 may be noted the following, who were made consul-general to Rio de Janeiro, Julius G. Lay, of Washington, D. C.; to Hankow, China, Robert Brant Mosher, of Washington, D. C.; to Bogota, Colombia, Maxwell Blake, of Missouri; to Santo Domingo, of the Dominican Republic, William W. Russell, of Washington, D. C.; to Frankfurt-on-Main, Prussia, Frank D. Hill of Minnesota; to Cape Town, Cape of Good Hope, Richard Guenther, of Wisconsin; to

Hongkong, China, George E. Anderson, of Illinois, to Vancouver, British Columbia, David F. Wilber, of New York, to Athens, Greece, William H. Gale, of Virginia; to Guatemala, George A. Buckin, Jr., of Oklahoma; to Monrovia, Liberia, William D. Crum, of South Carolina, to Callao, Peru, William H. Robertson, of Virginia, to Bucharest, Roumania, Roland B. Harvey, of Maryland, and to San Salvador, Thomas Ewing Dabney, of Louisiana.

United States Copyright Law. The new copyright law, approved 4 March 1910 and operative after 1 July of the same year, is a much more comprehensive measure than the old law, and, by an elaborate system of classification, makes the entire copyright question much more specific and accurate. The copyright office has issued the following application forms. A1, book by a citizen or resident of the United States, A1, for a book by a citizen or resident of a foreign country, but manufactured in the United States; A2, edition printed in the United States of a book originally published abroad in English, A3, a book in foreign language by a foreign author, A4, ad interim, a book published abroad in the English language, A5, contribution to a newspaper or periodical, B1, periodical, registration of a single issue, B2, general application and deposit; C, lecture, sermon, or address, D1, published dramatic composition, D2, dramatic composition not reproduced for sale; D3, dramatic-musical composition; E1, published musical composition; E2, musical composition not reproduced for sale; F, published map; G, work of art (painting, drawing, or sculpture), or model or design for a work of art, H, reproduction of a work of art; I, drawing or plastic work of a scientific or technical character, J1, photograph published for sale; J2, photograph not reproduced for sale; K, print or pictorial illustration. Each application for a copyright must distinctly specify to which of the above classes the work in question belongs and must be accompanied with the registration fee of \$1. Copies of the work to be copyrighted must also be supplied in various specific cases. Copyrights run for a term of 28 years at the expiration of which the proper person or persons may have them renewed for a like term. Copyrights are also assignable by any instrument in writing, provided such assignment is recorded within three months at the Copyright office. The other provisions of the new law take cognizance of the various complications suggested by individual classes.

United States Department of Commerce and Labor. The Department of Commerce and Labor, according to the 1910 report of Secretary Nagel, employed a staff numbering 10,258 during that year, not including the temporary employees who were utilized as census-takers, and enjoyed the use of an annual appropriation of \$21,421,209. A notable event during the department's year was the completion of a tide-perfecting machine by the Coast and Geodetic Survey, which is a branch of the Department of Commerce and Labor. The 1910 report also gave statistics of the immigration into the United States, during the year, of the foreign trade of the country, recommended that appeals be allowed in naturalization cases

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so as to secure harmony in court decisions; and suggested that some of the islands of the Bering Sea be made reservations on which furbearing animals may not be killed

The number of immigrants during 1910 was, 1,041,570, which represents an increase over immediately preceding years, although it was not as great as the total of 1907, when 1,285,349 foreigners emigrated to this country. However, the fact that the later months of 1910 showed a greater proportionate increase than the earlier ones would seem to indicate that this record will be surpassed in 1911. The countries of Russia, Greece, Italy and Austria supplied about 68 per cent of the immigrants to this country in the last year, while this country lost 202,436 immigrants who returned to their native lands. Concerning the work of the bureau of corporations, Secretary Nagel's report says that that branch of the department at the end of the fiscal year had on hand as work still pending, investigations into the lumber, steel and tobacco industries, the International Harvester Company, transportation by water in the United States, the concentration of water power ownership, and corporate taxation. The investigation of the lumber industry has, by reason of the great importance of the subject, been given precedence over all the others and it is expected that a separate report covering this subject will be issued sometime early in 1911. Altogether the work of this branch of the Department of Commerce and Labor has been important and comprehensive. Reliable information regarding business transactions is the first requisite toward establishing and enforcing proper regulation of business, and the bureau of corporations has made it particularly its work to gain such information. Once obtained, this information has been presented to the public in such a clear, concise manner as to be within the range of understanding of everyone, and, as a result, these basic business facts have been used to an ever-increasing degree in legislative and administrative action. What is even more important, the circulation of such information has served to put an effective check upon improper business methods in general. The publicity given by the reports of the bureau on various industries has been frequently marked by the disappearance of railway rebates, unfair methods of competition, and divers other forms of business oppression. Statements volunteered by numerous small business concerns give ample evidence of the truth of this, and show the wide scope to which the work of the bureau has attained. Such gratifying results have been made possible, only by the exercise of the utmost care on the part of the bureau in securing its data. Considerable time has been required in the preparation of each one of the reports, since accuracy and completeness are absolutely essential in order that the information may be entirely reliable. Probably the most effective single feature of the bureau's work has been the reduction of vast masses of business facts to a very few and plainly stated business conclusions, and for the performance of this work the bureau has developed through a series of years a highly trained force of specialists. It has had, as an almost invariable rule, access to the books of large corporations, and, which is still more encouraging, the voluntary coöperation of corporate managers. The Department

of Commerce and Labor also compiled elaborate statistics covering the foreign commerce of the United States for the year 1910. See UNITED STATES IMPORTS AND EXPORTS

United States Diplomatic Service. Diplomatic appointments during 1909 and 1910 were made according to a new system inaugurated early in 1909 by the First Assistant Secretary of State, Huntington Wilson. According to this plan, a record of efficiency is kept of every officer in the diplomatic employ of the country; diplomatic secretaryships are classified according to relative importance, and, when occasion for promotions arise, such promotions are made largely on the basis of the efficiency record, every effort being made to promote men progressively from a lower rank to a higher one. The incoming administration in 1909 naturally caused numerous changes in diplomatic circles, some of which were not settled until well along in 1910. The following is a list of the most important diplomatic appointments made during 1910. Envoy Extraordinary and Minister Plenipotentiary to Bolivia, Horace S. Knowles, of Delaware; Envoy Extraordinary and Minister Plenipotentiary to Bulgaria, Roumania, and Servia, John R. Carter, of Maryland, Minister Resident and Consul-General to the Dominican Republic, William W. Russell, of Washington, D. C.; Envoy Extraordinary and Minister Plenipotentiary to Guatemala, R. S. Reynolds Hitt, an American resident in France, Minister Resident and Consul-General to Liberia, William D. Crum, of South Carolina; and Envoy Extraordinary and Minister Plenipotentiary to Morocco, Fred W. Carpenter, of California.

United States Imports and Exports. The foreign commerce of the United States during the year 1910 shows a larger total than that of any previous year in the history of the country, with the sole exception of 1907. Imports, considered alone, reached the highest figure on record, but exports fell in value below the exports of both 1907 and 1908, in spite of the unusually high prices which prevailed. The total value of merchandize imported into this country during 1910 was \$1,556,947,430, against \$1,434,421,425 in the former high record year, 1907. The total value of domestic and foreign merchandize exported during 1910 was \$1,744,984,720, against \$1,860,773,346 in 1908, and \$1,880,851,078 in 1907, the high record years in exports. The imports thus exceeded, by \$122,526,005, the largest total of any earlier year, while the exports fell \$125,827,492 below the annual average of 1907 and 1908. While the increase in imports occurred largely in manufacturers' materials, the decrease in exports took place chiefly in foodstuffs, although the falling off in the latter was apparently due, in large measure at least, to increased consumption at home rather than to a decline in production. The wheat crop of the year 1909, the chief source of the 1910 exports of that grain, was, with a single exception, the largest in the history of this country, and the same holds true with respect to the 1909 corn crop (See WHEAT AND CORN). While the supply of food animals was somewhat diminished by the gradual breaking up of the great stock ranges in the West and the transfer of the livestock industry to the farms, the relative decline in the exportation of meats and food animals was much greater

U. S. MILITARY ACADEMY — U. S. NAVAL ACADEMY

than that in the number of food animals as reported from year to year by the Department of Agriculture (q.v.) This shortage in the surplus of the United States, which is the greatest food exporting country in the world, has been met in the world's markets by increased production and exportation of meats from Australia, New Zealand and South America, of wheat from Russia, Rumania, Australia, Argentina, Canada and India, and of corn from Argentina, Russia and Rumania. However, the reduction in the exportation of foodstuffs in the United States was in a measure off-set by an increase in the exportation of manufactures. The value of domestic manufactures exported in 1910 was larger than ever before, aggregating \$767,000,000 against \$485,000,000 in 1900, and forming in 1910 44.85 per cent of the domestic exports, against 35.37 per cent in 1900. The natural deduction to be drawn from these figures is that the United States is becoming a manufacturing rather than an agricultural nation. However, close students of the situation warn the manufacturers of this country that they must extend their markets if they are to expect continued prosperity—a task which will not be easy. In view of the expected opening of the Panama Canal (q.v.) within the present decade, this extension is one which should be undertaken with all due dispatch. Furthermore, all trade between American ports must be carried on in American boats, and fears have been expressed that, unless due care is speedily exercised, within five years or so this country will find itself with an insufficient supply of ships to handle its cargoes.

United States Military Academy. The United States Military Academy at West Point, N. Y., was established in 1802 for the training of military officers. Each Congressional district and Territory is permitted to have one cadet at the Academy, as are the District of Columbia and Porto Rico. Each State is further entitled to have two cadets from the State at large at the Academy, while 40 cadets are also appointed from the United States at large. Appointments are made by the Secretary of War at the request of a Senator, Representative, or Delegate in Congress, it being obligatory that the person appointed be a resident of the State, district, or territory from which the appointment is made. The appointments from the United States at large and from the District of Columbia are specially conferred by the President. The attendance at the beginning of the present academic year (1910-11) numbered 413, a total much below the proper strength of the corps, which during 1910 was 529, and, with the admission of Arizona and New Mexico to statehood, is increased to 534. To remedy this shortage, Congress has provided that, for a term of six years beginning 1 July 1910, whenever any cadet has finished three years of his course his successor may be appointed. Appointees to the Military Academy must be, at date of admission, between the ages of 17 and 22, weighing at least 100 pounds, not less than 5 feet 3 inches tall, unmarried, free from infectious and moral disorders, as well as from all deformity, disease, or infirmity. They must also be well versed in reading, writing and arithmetic, and have a knowledge of the elements of English grammar, descriptive geography and United States history. The course at

the Academy covers four years, the principal subjects taken up being mathematics, French, drawing, tactics of all arms of the service, natural and experimental philosophy, chemistry, mineralogy, geology, electricity, history, international, constitutional, and military law, Spanish, civil military engineering, and the science of war. The pay of a cadet is \$600 a year and upon graduation he is commissioned as a second lieutenant. The academic duties occupy from 1 September to 1 June, while from about the middle of June to the end of August cadets receive practical military training in camp. Examinations are held at the middle and end of the academic year, and cadets found deficient upon those occasions in either studies or conduct are dismissed from the Academy.

The penalty for hazing in any form at the Military Academy has been absolute dismissal, but the hazing scandals of 1909, together with the vigorous protests of the principals, have resulted in a modification of this order. Congress has decided that a clear definition of hazing must be drawn up and punishment for infraction of the hazing law be meted out by the Superintendent of the Academy in accordance with the gravity of the offence in question. For minor offences, suspension or any other punishment deemed fit may now take the place of dismissal, while in the case of a cadet's being charged with offences which would involve dismissal he may, upon written request, be granted a trial by a general court-martial. The cases of 1909 still pending, in which final action has not been taken, will be decided by the Secretary of War in accordance with these modifications of the hazing rule. The present superintendent of the United States Military Academy is Major-General Thomas N. Barry, U. S. A.

United States National Museum. The United States National Museum is the depository of the national collections, being a branch of the Smithsonian Institution (q.v.), established in 1846. Its specimens of American archæology, ethnology, geology, natural history and paleontology are unsurpassed, while its collections in American history and fine and industrial arts are also conspicuously good. It is both an educational and a research museum, and issues numerous technical and popular science bulletins. The National Gallery of Art consists largely of the collections of etchings and engravings of George P. Marsh, and collections of Charles L. Freer, containing numerous paintings and etchings by Whistler and examples of Chinese and Japanese art. The Harriet Lane Johnson collection, including specimens of the work of a number of the most celebrated English portrait painters, and the collection of William T. Evans of 100 paintings representing some of the best work of American artists, are also exceptionally excellent.

United States Naval Academy. In 1845 the United States Naval Academy was established at Annapolis, Md., for the training of officers for the United States Navy. The students of the Naval Academy are called midshipmen, two being allowed for each Senator, Representative, and Delegate in Congress, and five annually from the United States at large. The appointments of the five at large, as well as those from the District of Columbia, are made by the President. One midshipman, who must be a native of the island, is allowed from

UNITED STATES NAVY

Porto Rico, and this appointment, too, is made by the President, subject to the recommendation of the Governor of Porto Rico. The Congressional appointments are so distributed that each Senator, Representative, and Delegate in Congress may appoint one midshipman during each Congress. Candidates allowed for Congressional districts, for Territories, and for the District of Columbia must be actual residents of the districts or territories from which they are nominated. All candidates must, furthermore, at the time of their examination, be between the ages of 16 and 20 and free from infectious or moral disorder and from any deformity, disease or infirmity. No applicant can gain admission who is manifestly under-sized for his age. The course at the Naval Academy occupies six years, the first four of which are spent at the Academy and the last two at sea. At the expiration of this period the final examination for graduation takes place, those who pass it successfully being appointed to fill vacancies in the lower grades of the line of the Navy and of the Marine Corps, in the order of merit as determined by the Academic Board of the Academy. At least 15 appointments from such graduates must be made each year, while to surplus graduates who do not receive such appointments certificates of graduation, honorable discharges, and one year's sea pay, as provided for midshipmen, are given. The pay of a midshipman is \$600 a year. Captain John M. Bowyer, U. S. N., is the present Superintendent of the Academy.

United States Navy. The vessels in service, under construction and authorized 1 Jan. 1911, are 35 first class battleships, 1 second class, 12 armored cruisers, 1 armored ram, 4 single turret harbor defence monitors, 6 double turret monitors, 22 protected cruisers, 3 unprotected, 3 scout cruisers, 10 gunboats, 1 gunboat for the Great Lakes not yet begun, 3 light draft gunboats, 8 composite gunboats, the *Dolphin* and *Vesuvius*, (ships rated in a special class), 12 gunboats under 500 tons, 36 torpedo boat destroyers, 33 steel torpedo boats, 32 submarine torpedo boats, 5 auxiliary cruisers, 23 colliers and 8 transports and supply ships. In addition, there are training, receiving, hospital and other ships, none of which, however, figure in the fighting strength of the navy. There are also eight navy yards. The active list of the navy comprises 2,280 commissioned and 370 warrant officers, exclusive of 1,146 midshipmen at sea and at the Naval Academy. There are 780 commissioned and 110 warrant officers on the retired list. The enlisted strength allowed by law is 47,500 men and apprentice seamen. In addition, there is the United States Marine Corps, under the command of Major-General George F. Elliott, numbering 335 officers and 9,100 men. The Pacific fleet was reorganized on 1 Jan. 1911, pursuant to an order of Secretary Meyer. It now consists of armored cruisers, in the first division, *West Virginia*, flagship, *Colorado* and *Pennsylvania*, second division, *California*, *Maryland* and *South Dakota*.

Recent changes in the Naval Bureau have been the subject of an opinion by Attorney-General Wickersham. There was some question whether a new grade in the construction corps was created by the assignment of Washington L. Capps, as chief constructor with the rank of rear-admiral. The attorney-general holds that

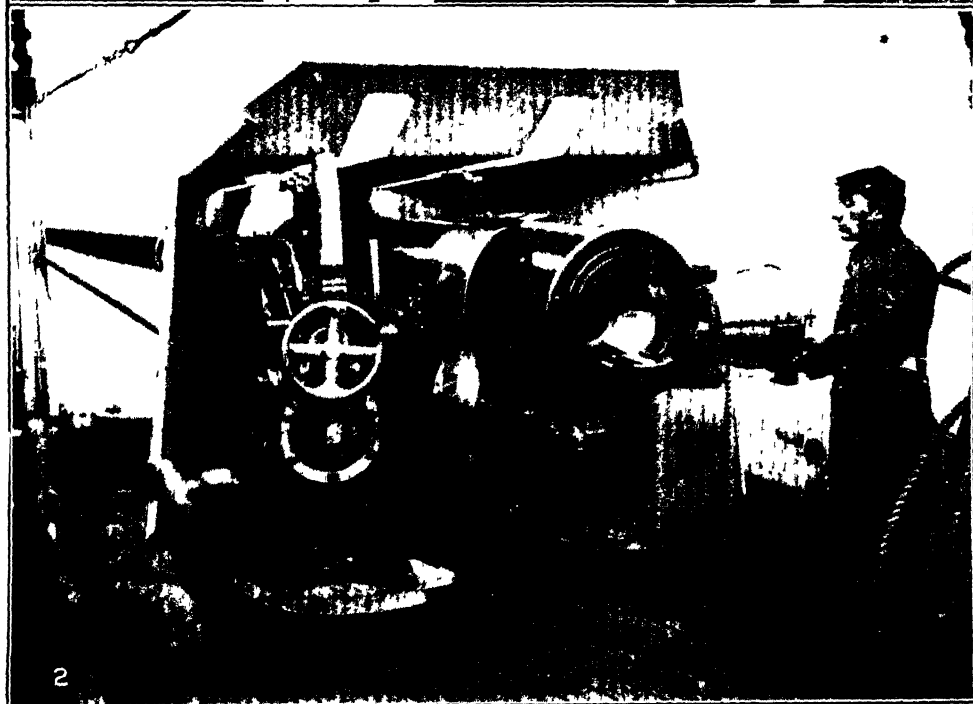
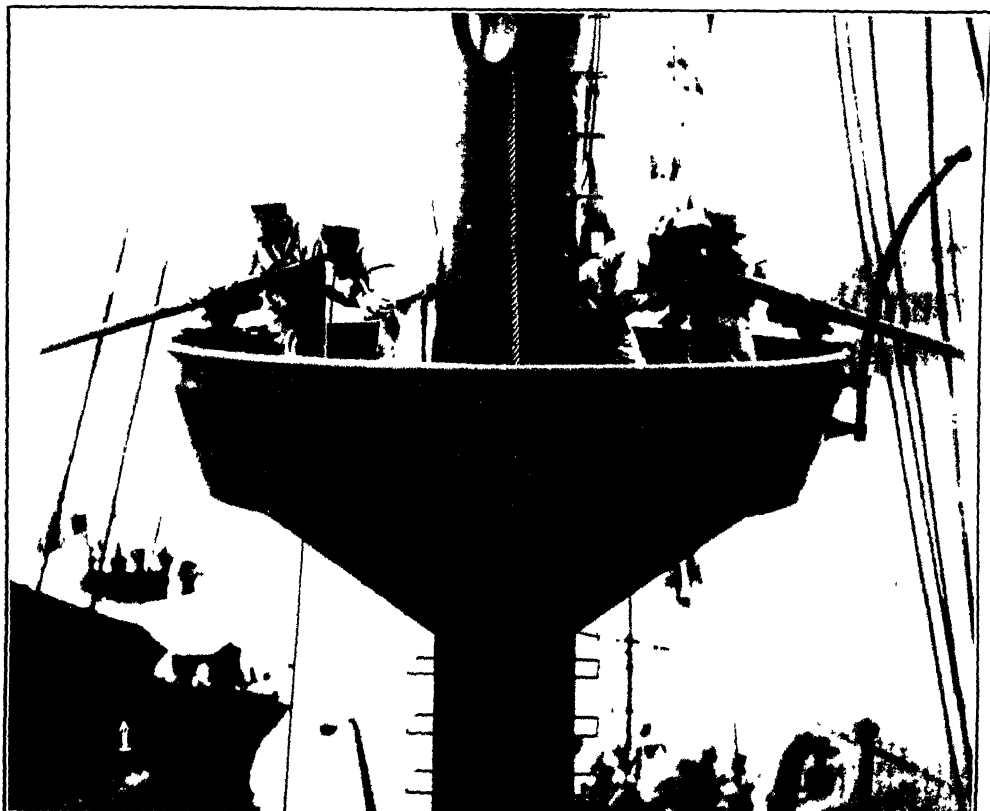
it does not, or that the same action has created a vacancy in the grade of naval constructor, with the rank of captain, or in the total number of naval constructors and assistant naval constructors as provided by law. The attorney-general was also called upon to decide whether an officer who has served as chief of a bureau in the navy, but resigns or is removed from that position "before the expiration of a total of 30 years service," may be retired, when, after an interval of return from the chiefship of a bureau to general duty, he becomes eligible for retirement, with the same rank and emoluments as if he had been retired or had become eligible for retirement while still acting as chief of the bureau. The decision of the attorney-general was in the negative.

There was much target practice indulged in during 1910. Several trophies were offered for the highest scores. There was one in the battleship class competed for by the cruisers of the Atlantic and Pacific fleets. The cruisers also competed for the trophy in the line-of-battle ships. It is said that the *Tennessee* made the best record of the cruisers of the Atlantic fleet in day firing, and the *Washington* was the best at night. Of the Pacific fleet, the *Maryland* made the best record.

The old monitor *Tallahassee* and the ram *Katahdin* will be subjected to an important series of tests by the Bureau of Ordnance having to do with ordnance, projectiles and armor. These two vessels in combination will be used as a floating proving ground, in addition to the ground at Indian Head, Maryland. The experiments will be devoted to the penetration of shells against various thicknesses of armor. For this purpose, various calibres of guns up to 12 inch ordnance will be mounted on the *Tallahassee*. The *Katahdin* will be used as a target. The support for the plates which are to be attacked is being specially manufactured. The Board of Ordnance has been charged with failing to use high explosives to the extent justified by the effectiveness of that class of ammunition. The reason why these high explosives have not been used is because of the risk involved in their storage on a war vessel. Reasons given for using these two vessels for this test was the impossibility of finding, at the Indian Head proving grounds, long ranges now proposed to be used in ascertaining the effect of projectiles on armor. These tests have hitherto been conducted on a theoretical basis, and it was impossible to ascertain the effect of the attack in time of war. With the two vessels, it is possible to obtain any range.

During 1910, the largest number of officers were placed on the retired list since 1905, and eight more than in 1909. There were 58 who left active service. Of this number, 15 were rear-admirals, 8 commodores, 6 captains, 3 lieutenant-commanders, 4 lieutenants, 3 ensigns, and 1 surgeon-general. The officers of the flag rank were Rear-Admirals W. W. Kimball, Uriel Sebree, A. P. Nazro, William Swift, J. D. Adams, A. C. Dillingham, A. Marix, J. A. Rodgers, C. P. Reese, A. G. Berry, H. Winslow, J. B. Milton, C. H. Arnold and T. S. Phelps. Fourteen of the officers were retired under the pension law. During the last year, nine officers above the rank of midshipmen resigned their commissions as against one-half of the number in 1909. There were no resignations among the

UNITED STATES NAVY



1. In the fighting-top of a United States warship.
- 2 Opening the breech of a powerful gun on a United States warship

Marine Corps officers During the last year, nine officers were tried by courts-martial, one of whom was dismissed for embezzlement. There were four courts-martial in the Marine Corps, one captain, two first lieutenants and one second lieutenant. No dismissals resulted. There were only three deaths among the active officers of the navy in 1910, which were 11 less than in 1909. The list included one captain, one lieutenant and one ensign. There has been a steady increase, however, in the deaths of retired officers. In 1910 they numbered 37, including 7 rear-admirals, 5 commodores, 3 captains, 2 commanders, 1 lieutenant-commander, 4 lieutenants, 5 chief engineers and one chief constructor. Among the active officers of the Marine Corps, there were no deaths and only one among the retired, Brigadier-General Robert L. Meade.

Secretary of the Navy Meyer, in his annual report for 1910, recommended that the sum of \$2,700,000, heretofore used as the navy supply fund, be returned to the treasury. This amount represents a saving that was affected in five months under the Meyer accounting system, which came into operation on 1 July 1910. The trial of this system for a period of two years was authorized at the last session of Congress. Mr. Meyer believes that the results already obtained demonstrate its efficiency, and will ask Congress to make it permanent.

The question of oil as fuel has attracted increasing attention in recent years. "It will be only a short time until the whole navy of the United States" says Rear-Admiral Evans, retired, "will be run by oil power—the greatest power in the world to-day. We are looking for results in the navy—what will bring results in the easiest way, not what will benefit merely a few people. That is why I believe oil as fuel will be generally used within a short time. It will be used for the same reason that we would dispense with men entirely in the navy if we could train and shoot guns wholly with electricity, which I am sure is as much of an impossibility as I believe that aeroplanes will ever be a factor in naval warfare. As to what it will really do, I can call attention to one of our recent experiences. The fleet went from New York to San Diego, a distance of 52 days, with coal as power. Coming back, we discarded the coal and used oil burners. We made the same time with the oil, and, in addition, we saved \$500 a day in expenses. This, of course, is not only in the pay of men, but in their keep, the cost of coal, and the vast expense of having lighters come and take the ashes and other refuse at great expense past Sandy Hook Light and dump them. Naturally, all this is done away with with oil and there is none of the wear and tear on men, clothes and ship that there is in coal."

A bill to create a medical reserve corps for the navy was introduced in the Senate. The bill authorizes the President to issue commissions as assistant surgeons, with the rank of lieutenant, junior grade, to such graduates of reputable schools of medicine as are found qualified to hold such commissions, and the persons so commissioned to constitute and be known as the Naval Medical Reserve Corps. It is intended that the commissions so given shall confer upon the holders all the authority, rights and privileges of commissioned officers

of like grade in the Medical Corps of the navy, except promotions, but only when called into active duty.

United States Pensions. See PENSIONS, UNITED STATES.

United States Supreme Court. Within the last two years the United States Supreme Court has been a heavy loser, three of its members having been taken away through death, while one, Associate Justice William H. Moody, was retired on account of his advanced years. On 4 July 1910, the venerable Chief Justice, Melville W. Fuller, who for so many years presided over the deliberations of this, the highest court in the land, passed away at his summer residence at Bar Harbor, Maine. Hardening of the arteries caused the death of Associate Justice Rufus Wheeler Peckham on 24 Oct. 1909, and on 28 March 1910 another Associate Justice, David J. Brewer, passed away. All of these vacancies were filled before the close of 1910. The justices who took their places on the Supreme Court bench during that year were Charles E. Hughes, of New York, who resigned the governorship of that State in order to accept the appointment, Joseph R. Lamar, of Georgia, and Willis Van Devanter, of Wyoming. In 1909 Horace H. Lurton, of Tennessee, was appointed to fill the vacancy left by the death of Associate Justice Peckham. Considerable delay in choosing a new Chief Justice followed the demise of Chief Justice Fuller. It was reported in state circles for some time that the choice would fall upon ex-Governor Hughes, and that he had abandoned his gubernatorial duties on that understanding. This rumor was proved groundless, however, when Edward D. White, of Louisiana, an Associate Justice since 1894, was named for the office. The present make up of the United States Supreme Court is, therefore, as follows: Chief Justice Edward D. White, of Louisiana; Associate Justices John M. Harlan, of Kentucky; Joseph McKenna, of California; Oliver Wendell Holmes, of Massachusetts; William R. Day, of Ohio; Horace H. Lurton, of Tennessee; Charles E. Hughes, of New York; Joseph R. Lamar, of Georgia, and Willis Van Devanter, of Wyoming. Appointments to the Supreme Court bench are for life, the salary being \$12,500 a year in the case of Associate Justices and \$13,000 for the Chief Justice. J. H. McKenney, of Washington, D. C., is the present clerk of the Supreme Court; J. M. Wright, of Kentucky, marshal; and Charles H. Butler, of New York, the reporter.

United States Tariff. A growing national sentiment in favor of a downward revision of the tariff of this country finally crystallized itself in the promise of such revision in the Republican presidential platform of 1908. Accordingly, during the last two months of that year, hearings were held by the Ways and Means Committee at which those whose commercial interest was most vitally at stake and whose knowledge of tariff questions qualified them as experts gave testimony. On the basis of this testimony, that committee drew up a tentative schedule, designed to aid Congress in its colossal task of revision. Congress went into special session in 1909, shortly after the inauguration of President Taft, and on 9 April a bill was reported to the House by Repre-

UNITED STATES TARIFF

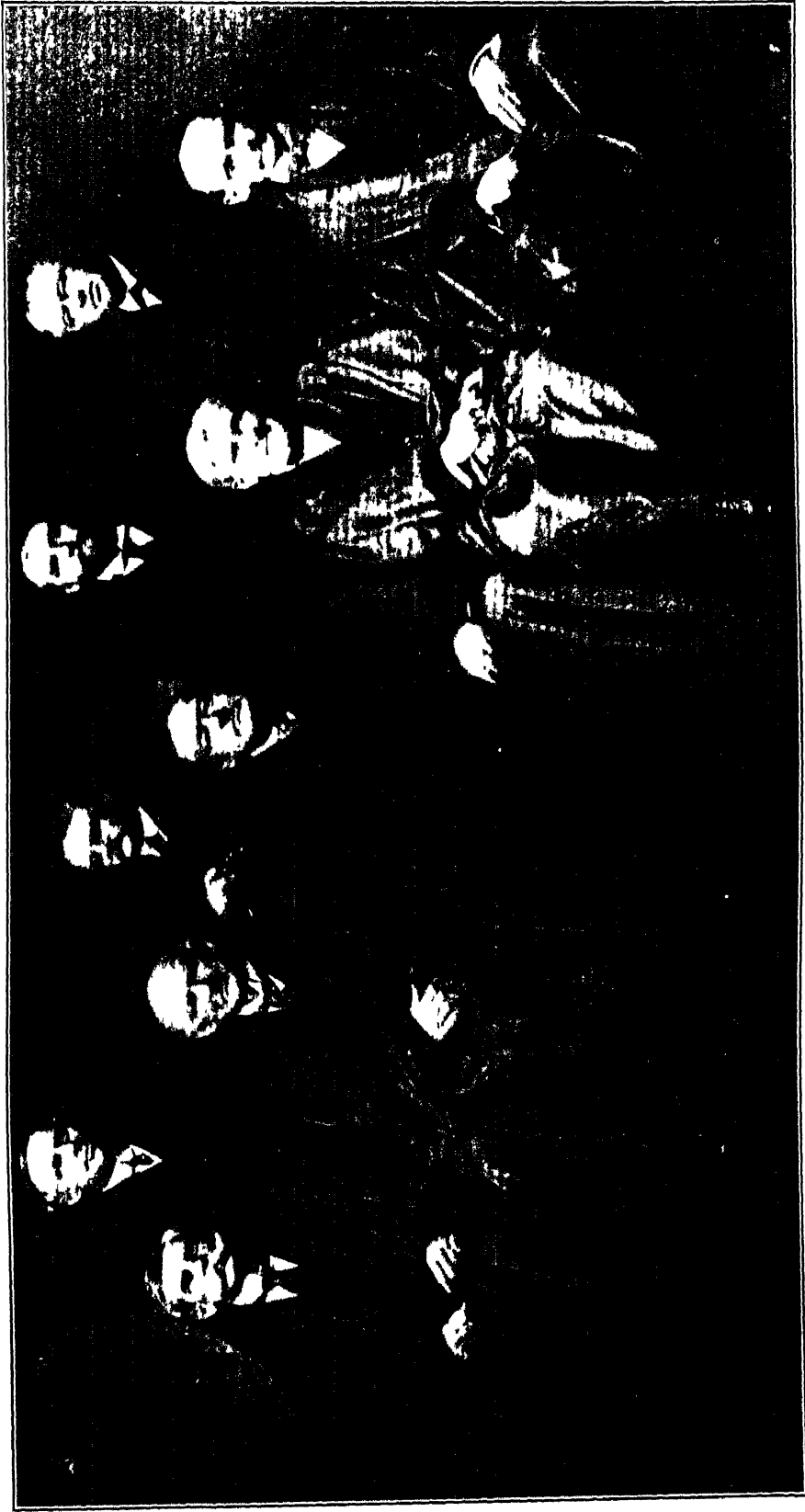
sentative Payne of the Ways and Means Committee, and passed by that body after extended and heated discussion. This bill, which served as a foundation for the tariff law as finally revised in 1909, put iron ore and petroleum, together with all petroleum products, on the free list, called for substantial reductions on iron and steel, together with the products of both, as well as on coal, lumber, hides and chemicals, and advanced the tariff on almost all textiles, as well as on hosiery and gloves. The latter provision stirred up the entire country, meaning, as it appeared to, that cheap stockings would practically go out of existence in this country. In fact, the entire schedule was highly unsatisfactory to the "Insurgent" Congressmen and that portion of the voters whom they represented, as this was the element that had previously been most insistent in demanding a revision of the old Dingley tariff. What the advocates of revision most ardently desired was reduction in the duties on iron and steel and their manufactures, on hides, leather and leather manufactures, sugar, petroleum and its products, and wood pulp, and paper. Only by such reduction, they claimed, could the growing control of the vast corporate interests which handle these commodities be checked, and the disadvantageous features of the extensive combination be in any degree overcome.

However, the bill presented by Senator Nelson W. Aldrich to the Senate on 12 April, as an alternative to the Payne measure, was even less in harmony with these views than had been the bill ratified by the house. This measure, popularly called the Aldrich bill, although it avoided the hosiery and gloves provision which had excited such widespread disapproval, increased the duty on rough lumber 50 per cent above that named in the Payne bill; left unchanged the high protective rates of the Dingley law on petroleum and its products; imposed a .25 per ton duty on iron ore, which, according to the Payne measure, was to have been admitted free, and rearranged both the cotton and silk schedules so as generally to impose specific duties in place of *ad valorem* rates called for under the Dingley tariff. With almost the entire press of the country united against it and the senatorial "Insurgent" element loudly decrying it, this bill at length passed the Senate on 8 July, and three days later the matter went to the Conference Committee for final consideration. Strongly urged by President Taft to favor the middle schedules of the Payne bill, the committee drew up a measure, known as the Payne-Aldrich bill, practically representing a compromise, which was simultaneously presented to both Houses of Congress on 29 July. This bill was passed immediately, without any very strenuous opposition, by the House of Representatives and, although still stubbornly fought by the "Insurgent" Senators, passed that body on 5 August, without having suffered any change. On the same date the bill became law when the President's signature was affixed to it.

The schedules which are most radically changed by virtue of the Payne-Aldrich bill are those of metals, silk, and the manufactures of both lumber, chemicals, oils and paints, paper and paper pulp, hides and leather, together

with the manufactures of the latter, and the manufactures of cotton. In the case of metals the revision was for the most part downward, iron ore being decreased from \$0.40 to \$0.15 per ton, pig iron from \$4 to \$2.50 per ton, scrap iron from \$4 to \$1 per ton; steel rails from \$7.84 to \$3.92 per ton, structural steel from \$10 to \$6-\$8, while the duty on boiler plate of the cheaper grades was cut down 40 per cent; that on steel ingots, etc. (valued at less than \$0.24 per pound) 2 per cent, and the lower grades of both iron and steel wire $\frac{3}{4}$ of a cent. The increases presented in the new metal schedules occur in the cases of most grades of cutlery, the advance in these cases being very large, and in the punched structural steel where they amounted to 40 per cent, and in steel ingots, etc. (valued at more than \$0.24 per pound) where they extended from 28 to 70 per cent. Specific rates replaced the former *ad valorem* tariff in numerous instances, the aggregate changes resulting in an increase over the Dingley duties. The most important change in the chemicals schedule was, without any doubt, the placing of petroleum, together with the products thereof, on the free list and so removing it from the high protection it had previously enjoyed, although the aggregate result of the revision in this schedule represented an advance. The only increase of any note in the lumber schedule occurred when shingles were advanced from \$0.30 to \$0.50 per thousand, and while the rates on unfinished lumber were reduced from \$1-\$2 to \$0.50-\$1.25 per 1,000 board feet, and those on finished lumber by approximately 25 per cent. The rates of the Dingley law with regard to chemical wood pulp remained unaltered, with an additional countervailing duty in case of a foreign export duty. On the other hand, mechanically ground wood pulp was given a place on the free list, and the lower grades of print paper reduced from \$6 to \$3.75 per ton, while the higher grades showed increases ranging all the way from 10 to 25 per cent. The revised leather schedule placed hides on the free list and reduced leather from a tariff of 20 per cent *ad valorem* to 15 per cent, and shoes from 35 to 20 per cent. The most elaborate revision occurred with regard to the cotton schedule, and its aggregate result was to retain approximately the old duties on the lower grades of cotton fabrics and progressively advance those on the higher grades. In this schedule, too, specific rates were adopted in place of the former *ad valorem* ones and an intricate system of classification, taking account of value, weight and the number of the threads, was required.

The Payne-Aldrich law also calls for free importation into this country of all products grown in the Philippines Islands and of all manufactures from materials which have been produced in the Philippines or the United States, to the value of 20 per cent or more, with the sole exceptions of rice, sugar, and tobacco. No more than 300,000 tons of sugar will be admitted annually to this country from the Philippines without duty, while in the case of tobacco, no more than 300,000 pounds of wrapper, 1,000,000 pounds of fibre, and 150,000,000 cigars will be annually admitted without duty. It is further stipulated that all products of the Philippines admitted into this country duty



UNITED STATES SUPREME COURT

Beginning at the left, standing are Van Devanter, Lurton, Hughes, and Lamar
Beginning at the left, seated are Holmes, Harlan, White (Chief Justice), McKenna and Day

UNIT SYSTEM OF VALUATION—URUGUAY

free shall be exempt from any export duty, and that all products of the United States shall be admitted without duty into the Philippine Islands. A unique section of the new tariff law is the provision assuring commercial considerations at the hands of other countries by means of a maximum and minimum system of tariffs, the latter being the rate stipulated in the various specified schedules, while the maximum is attained by the addition of 25 per cent to each duty. Discrimination in the administration of this policy is left to the judgment of the President.

Taken altogether, the Payne-Aldrich tariff represents a downward revision in that the duty has been reduced in more instances than it has been advanced. It is to this fact that its supporters point in claiming that it has not only fulfilled party pledges, but has also answered the public demand. The tariff, however, has become more a national than a party issue, and party lines are thrown to the wind by statesmen and civilians alike when its discussion is broached. It is undeniable that, despite the extended deliberations of both Houses of Congress, a great deal of general dissatisfaction is still manifested against the Payne-Aldrich law. Its detractors hold that the reductions, save in a few isolated cases, have been made in cases where the necessity for them was either trifling or altogether absent, whereas the schedules which were really in need of a downward revision have either been left practically intact or else actually advanced. They also claim that, so far as checking the evils attendant upon combination is concerned, or limiting vast corporate power, the new tariff has shown itself utterly useless. It now seems probable that the question of revision will be again taken up by Congress during 1911 and the Payne-Aldrich act amended and altered. The Tariff Board, at present composed of Henry Crosby Emery, professor of political economy at Yale University, James Burton Reynolds, Assistant Secretary of the Treasury, and Alvin H. Sanders, editor of the *Breeders Gazette*, of Chicago, is now working over tariff problems, assisted by a host of investigators and experts. This board was appointed on 15 Sept 1909, by President Taft, and the results of its work will be at his disposal at any time they are called for. During the first year of the operation of the Payne-Aldrich tariff its working is shown by the following figures, compiled by the Bureau of Statistics of the Department of Commerce and Labor: Imports in millions: free, 768; dutiable, 794.6; total 1,562.6; per cent free, 49.2; customs receipts in millions, 327.9.

Unit System of Valuation. See TAX ASSESSMENTS, AUTOMATIC; and OHIO, *History*, 1910.

Universities and Colleges. See EDUCATION.

Upper Senegal and the Niger. A French colony in West Africa, formed in 1904; area about 70,000 square miles; population approximately 5,500,000, of whom about 2,000 are Europeans. The colony was formerly under military, but is now under civil administration, similar to that which obtains in other French protectorates in Africa. Figures concerning the revenue and trade are swallowed up in those of French West Africa. Education is

quite well attended to in the colony, there being, at last returns, 50 official schools, 2 private schools, and a Mussulman school, with a total of about 1,750 pupils and students. Agriculture is successful, ground nuts, millet, maize, rice, cottons, etc., being cultivated. The imports comprise cottons, food products and metal work. The exports are chiefly nuts, cattle, rubber, skins and wool. A railway 350 miles long was opened in 1904, there are 4,050 miles of telegraph line, and 74 of telephone line in the colony, and there is a steam-boat service from Konlikoro to Timbuktú, the capital. Timbuktú is soon to be in telegraphic communication with Algeria.

Uruguay. A South American Republic, lying between the Atlantic Ocean, the Río de la Plata, Brazil, and the Argentine Republic. The area is 72,210 square miles, and the population 1,112,000, or 15.4 per square mile.

Government and History.—The President of Uruguay is chosen by the General Assembly for a term of four years, salary, \$36,000 per year. He cannot be elected to succeed himself, and in case of his disability or death the presiding officer of the Senate assumes the presidency. He is assisted by a cabinet of five ministers, who are directly responsible to him. The General Assembly is composed of the Senate and the House of Representatives. There are 19 Departments in the government, each of which sends a senator to the Legislature. Between 2,000 and 3,000 inhabitants are represented by each member of the House. The representatives hold office for three years, and the senators for six years. The Government is active in the establishment of colonies throughout the country. Uruguay was discovered in 1515 by Juan Díaz De Solís; explored by the Spaniards and Portuguese; and colonized under the Jesuits in 1624. The declaration of independence at Buenos Ayres, in 1810, originated the movement for freedom in Uruguay, and the next year it had gained its independence. The constitution was promulgated in 1830, and General Fructuoso Rivera was elected first President of the Republic.

Finance.—The Government receipts for 1909-10 amounted to about \$24,301,500, and the expenditure to about \$21,918,350. During the year the export tax on preserved meats was reduced from 50 cents to 20 cents (nominally) per 100 kilos. Other reductions, it is estimated, will cost the Government about \$500,000. The total amount of the national debt at the end of 1909 was about \$141,238,000, showing an increase for the year amounting to \$5,874,650.

Railways and other Communications.—There are five working railway companies in Uruguay, and there are in operation about 1,540 miles of railway, of which 780 miles are State-guaranteed. There are 340 miles under prospective construction. The Government has made a contract with the Pan-American Trans-Continental Railway Company for the construction of a railway from the northern frontier of the Republic to its southern border at Colonia. This line will establish rapid transit between New York and Pernambuco, Brazil, by high-speed steamers, thence by rail to Valparaiso, via Río de Janeiro and Buenos Ayres. The Uruguay line, 378 miles in length, penetrates to the heart of the agricultural territory, and,

URUGUAY — UTAH

when completed, will be of great value in facilitating the efforts of the Government toward colonization. The internal waterways of Uruguay afford splendid privileges for communication. There are 700 miles of navigable rivers, of which the most important is the Rio de la Plata. The mercantile marine of Uruguay has a steam tonnage of 71,016 and of sailing vessels 17,722 tons. A dam is to be built on the Rio Negro, for the improvement of which river \$4,136,000 is to be appropriated. There were 1,025 post-offices in the Republic in 1909, and twenty new post routes were established. The revenues for the year amounted to \$516,129. There are 248 miles of telegraph lines—over 1,000,000 telegrams being received and despatched in 1909. There is a Marconi wireless station at Punta del Este.

Agriculture and Industries—Ninety-seven per cent of the land of the Republic is devoted to pasture, but there are valuable agricultural pursuits and products nevertheless. Wheat grown, last reports, amounted to 202,208 tons, from 617,000 acres; flax, 18,372 tons, from 64,000 acres; corn, 3,011,726 bushels, from 410,068 acres; oats grown on 8,000 acres; barley, on 5,000; and canary seed on 700 acres. The vineyards are successful; wine production being 4,904,321 gallons, according to recent statistics. Fruits, vegetables, medicinal plants and tobacco are grown in varying quantities. In 1908-09 there were 26,000,000 sheep in the country, and the wool-clip amounted to 114,639,200 pounds. There are large and numerous slaughter-houses, where 250,630 cattle were killed, in 1907, under expert inspection. A national exhibition of dairy products is coming. Ostriches are raised in Uruguay, and profitably. Woolen factories are in operation, one of them employing 600 men, and weaving more than 2,500,000 pounds of wool. A brick-kiln turns out 60,000 bricks a day. There is a glass factory with capacity of 3,600 demijohns and 9,600 bottles per day. There are soap factories, carriage-works and a sugar factory in the country. The minerals of the country include coal, gold, petroleum, asbestos, antimony, graphite, copper-silver and copper-iron. Precious stones exist. It has been discovered that Uruguay's climate is very favorable to the production of olives. The yield for 1910 was approximately (or more than) 700,000 pounds.

Trade.—The agricultural exports in 1909 were about as follows: To Belgium, 914 tons of barley, 7,397 tons of flour; 893 tons of linseed; 10,128 tons of oats and wheat; and 4,453 tons of Indian corn. To Germany, 2,725 tons of bran; 417 tons of linseed; and 2,260 tons of oats and wheat. To Great Britain, 2,591 tons of Indian corn; 554 tons of flour; 80 tons of linseed oil cake; and 654 bales of linseed straw. To United States, 8,462 cases of onions and garlic; and 3,980 bags of quebracho extract. Live cattle exported during 1909 numbered 38,481; sheep, 42,063; horses, 8,864. Britain in that year received 63,000 beef quarters; 4,128 packages of canned beef; 21,277 bales of jerked beef; 105,338 mutton carcasses; and 11,233 packages of canned tongue. There were 2,393,078 cow-hides exported, United States receiving 1,252,927. A vast number of animal products are shipped from Uruguay annually, of which United States claims her share. Total exports in 1909 amounted to the

value of about \$47,621,300, and the imports to the value of about \$38,643,000.

Justice and Education.—The judiciary is composed of a Supreme Court of Justice, two courts of appeals, and a number of lower courts. The justices of the Supreme Court are elected by the National Assembly, the judges of the other courts are appointed by the Supreme Court. Elementary education in Uruguay is compulsory. There were, at the close of 1909, 791 public schools, with an attendance of 74,896 pupils, 289 private schools, 4,000 attendance, normal schools, a school of arts and trades; a national military school, and a university at Montevideo, the capital.

History, 1910.—Although comparatively free from revolutions, the Republic of Uruguay was threatened with serious revolt in Oct. 1910. A force of 10,000 rebels was raised and several towns were taken, but the Government ended by securing the unconditional surrender of all concerned. Vigorous press censorship prevented the full details from being learned. The existence of a revolution became apparent 27 October, when several bodies of revolutionists, well armed, crossed the Brazilian frontier and directed their march towards Montevideo. The Government was also disrupted by the resignation of Doctor Bachini, the Foreign Minister, who led the opposition against the successor to President Williman, Jose Battle y Ordenez. Doctor Bachini, while still minister, issued a manifesto declaring the Government unable to prevent the revolution from spreading. Bachini was credited with presidential aspirations. On 7 November the number of armed men in the field had increased within two weeks from 3,000 to 10,000, and they captured Nico Perez, a town 125 miles from Montevideo, but, although they reached a point within 50 miles of the capital, they were unable to enter it. The disposition of troops along all the chief avenues of approach blocked the movement, and on 14 November the insurrectionists laid down their arms and submitted to arrest. President Williman was elected 1 March 1907, for a term of four years, and his title to office has not been contested. The rebellion was not against him, but the choice of his successor. A small uprising over the same question occurred in Jan. 1910, but was promptly suppressed. The government party in Uruguay is known as the Reds and the insurrectionists as the Whites, or Nationalists.

Utah. A State of the Mountain division of the United States, with an area of 84,928 square miles, of which 2,601 square miles are water. The population, in 1910, was 373,351, an increase of 96,602, or 34.9 per cent, in the past 10 years, the density being .45 per square mile. Salt Lake City is the capital, with 92,777 inhabitants. Utah ranks 41st in population.

Agriculture.—The acreage, production and value of the important farm crops in Utah in 1910 were as follows: Corn, acreage, 133,000 acres, yield per acre, 30.3 bushels, production, 394,000 bushels; total farm value, \$331,000. Winter wheat, acreage, 155,000 acres, yield per acre, 20.5 bushels, production, 3,178,000 bushels; total farm value, \$2,670,000. Spring wheat, acreage, 100,000 acres, yield per acre, 25.3, production, 2,530,000 bushels; total farm value, \$2,125,000. Oats, acreage, 58,000, yield per acre, 43.0 bushels, production, 2,494,000 bushels; total farm

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value, \$1,197,000 Barley, acreage, 13,000 acres, yield per acre, 360 bushels, production, 468,000; total farm value, \$281,000 Rye, acreage, 3,000 acres, yield per acre, 185, production, 56,000 bushels, total farm value, \$38,000 Potatoes, acreage, 15,000 acres, yield per acre, 142 bushels, production, 2,130,000 bushels, total farm value, \$1,257,000 Hay, acreage, 380,000 acres, yield per acre, 3 tons, production, 1,140,000 tons; total farm value, \$10,260,000 According to the last census, the area of appropriated land within the State was 5,674,608 acres, reserved, 8,735,046 acres, unappropriated and unreserved, 38,279,631 acres, of which 12,303,776 acres were surveyed and 25,975,855 acres unsurveyed. The State contains 52,689,285 acres, of which 1,664,640 acres are water In 27 counties there were 21,800 farms with a total area of 1,790,700 acres, of which 700,396 acres were under cultivation. There were 300 incorporated irrigation companies in the State, and the Federal Government has undertaken an immense irrigation project for the reclamation of a vast arid region With the help of irrigation, agriculture is the leading occupation of the people of Utah. The production of beet sugar in 1909 amounted to 40,828 tons. Much attention is paid to vegetables and fruit trees There is a considerable livestock industry In 1910 the numbers were Horses and mules, 133,000, milch cows, 88,000, other cattle, 327,000; sheep, 3,177,000, swine, 61,000 The wool clip (1908) yielded 14,700,000 pounds of wool, valued at \$2,231,460.

Mining and Manufactures—The State has valuable mines, chiefly gold, silver, copper and coal The output of gold in 1908 was 190,922 fine ounces, valued at \$3,946,700; silver, 8,451,300 fine ounces, value, \$4,520,600; copper, 71,370,370 pounds, value, \$9,420,889, lead, 42,455 short tons, value, \$3,566,220; coal, 1,846,792 short tons, value, \$3,119,338 Other products are manganese ores, gypsum, petroleum, sulphur Zinc was obtained, in 1908, to the amount of 282 short tons, value, \$26,508 Salt collected, 242,678 barrels, value, \$169,833 The total value of the mineral output in 1908 was \$26,422,121 There were 606 manufacturing establishments, employing 979 salaried officials and 8,052 wage-earners Their aggregate capital amounted to \$26,004,011; cost of material in a year, \$24,939,827, value of output, \$38,926,464 Smelting and refining copper is the most important industry. In 1906, six smelters in the Salt Lake Valley treated ores valued at \$50,000,000 Other industries of some importance are flour and grist milling, using up \$2,043,054 worth of raw material, and yielding an output worth \$2,425,791; the making and repairing of cars, value of output, \$1,886,651; factory production of butter and cheese, value, \$963,811, salt manufacture, brewing, fruit and vegetable canning, and the manufacture of boots and shoes There are no navigable streams but singularly good facilities for transportation The State has about 2,500 miles of railroad line and 80 miles of electric railroad.

Government—The present Governor of Utah is William Spry, with a salary of \$4,000 The Secretary of State is C. S. Fingey; Treasurer, David Mattson; Auditor, Jesse D. Jewkes; Attorney-General, A. R. Barnes; Superintendent of Education, A. C. Nelson; Commissioner of Insurance, Willard Done, all Republicans The Legislature consists of a Senate and House

of Representatives; but the constitution provides for the initiation of any desired legislation by the legal voters or such number of them as may be determined by law; and such voters may require any law passed by less than a two-thirds vote of each House of the Legislature to be submitted to the voters of the State before coming into effect. The Senate (in part renewed every two years) consists of 18 members, elected for four years; the House of Representatives has 46 members elected for two years. Qualified as electors are all citizens, male or female, who, not being idiots, insane, or criminal, have resided one year in the State, four months in the county, and 60 days in the precinct in which the election is held

Finance—The total assessed valuation of Utah in 1910 is \$186,354,505 The bonded debt is \$9,000,000 The total receipts for the fiscal period 1909-10, exclusive of the appropriation from the United States, were \$6,072,126.36. The total amount of disbursements by State warrants for the same period, \$5,685,334 15

Religion and Education—The Latter Day Saints form about 88 per cent of the church membership of the State There are Catholics, Presbyterians, Methodists, and Congregationalists in small numbers The public school system, introduced in 1890, includes kindergarten, primary, grammar and high school, an agricultural college, and a university School attendance for 20 weeks annually (10 consecutive), in large cities 30 weeks (10 consecutive), is compulsory on children from 8 to 16 years of age. In 1908 the school attendance was 81,535, out of a school population of 98,660, the amount expended being \$2,329,965. The number of schools were 662 and of teachers, 544 male and 1,562 female The public high schools had 176 teachers and 3,421 pupils. A State normal school had 22 pupils; it is maintained in connection with the university. The University of Utah was organized in 1850, and had 71 instructors and 853 students in 1908 Utah has a school of arts and sciences and a State school of mines. The Utah Agricultural College (founded in 1890) has 53 instructors and 687 students. Both of these institutions receive annual grants from the State. The Mormon Church maintains Brigham Young College at Logan, organized 1879, which has 46 instructors and 886 students There are several other Mormon colleges, and also Roman Catholic, Presbyterian and Protestant Episcopal colleges

Charities and Corrections—Apart from almshouses and asylums for imbeciles, there are 12 benevolent institutions within the State. Seven of these are hospitals, one of which belongs to the Federal Government and one to Salt Lake City The State has an institution for the deaf, the dumb, and the blind, with 102 inmates, an industrial school with 284 juveniles under its control, and a mental hospital with 353 patients There are three orphanages and various other charitable institutions (including five hospitals), provided by private associations or religious bodies. The county commissioners provide for the indigent of their counties, and erect, maintain and regulate poorhouses, etc., at their discretion. They may take measures to prevent paupers being brought into their counties. Parents,

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grandparents, children, grandchildren, brothers and sisters of a pauper are liable for his support.

Legislation—Utah had no regular legislative session in 1910. In 1909 the State Board of Land Commissioners was authorized to conduct experiments in sinking wells on arid land for culinary and domestic purposes. The right of eminent domain was extended to sites for mills, smelters and other works for the reduction of ores. It was made a misde-

meanor for a superintendent, foreman, or boss to receive any valuable consideration for employing a person or continuing him in employ. The portrait of a person may not without his consent be used for advertising purposes. Irrigation districts were authorized. A dairy and food bureau was created with power to enforce sanitary measures. A commission for the conservation of natural resources was created, and provisions made for protection against disease among livestock.

VACCINATION. The question of the efficacy of vaccination is one which is agitating the public mind at the present time. On the one hand, the vast majority of physicians assert that vaccination is beneficial, and a sure means, or almost so, of preventing smallpox; and point to their practice, to statistics, to the facts of bacteriology, and the well-known decrease of smallpox, as a proof of their contention. On the other hand, a large number of well-informed people assert just as emphatically that vaccination does not prevent smallpox; that it is a dangerous and harmful practice; that there is no good evidence of its ever having prevented smallpox; that statistics prove that it has not; and they cite a number of eminent authorities in support of their contention—affirming that the decrease in the virulence of smallpox, and the number of its visitations, is due to other causes—improved sanitary and hygienic conditions, simpler food, and other habits of the people, etc. The war is a bitter one, and there are no indications that it will be settled in the near future. Only very recently, Herbert A. Thorpe, of Staten Island, refused to permit his children to attend school, if they had to be vaccinated. He was summoned for violating the Compulsory Education Law, and the case went to trial. It was proposed to make a test case of the affair. Similar cases have frequently occurred before, and serve to indicate the temper of many persons towards vaccination.

Vaccination is based on the principle—now accepted in many quarters—that, by inducing a slight attack of a disease, anti-toxins are thereby generated within the system capable of rendering the patient more or less immune for some time to come against more severe attacks of the same disease. (See SERUM THERAPY). Whether it actually does so is the question. Statistics may be quoted both for and against, and prove very little. The theory of the treatment is open to more rational debate. Professor Crookshank, and Doctor Creighton—two of the highest authorities in England—have contended that the practice of vaccination is a "harmful superstition"; that it frequently engenders disease, and that it is impotent to prevent smallpox. In this, they are supported by Sir Alfred Russel Wallace, William Tebb and other notable men of science. The Minority Report of the Royal Commission, in England, also reported against the practice; and, on the strength of their evidence, vaccination was made optional in England. Against these views may be placed those of the majority of the medical profession; and the facts must be studied impartially, in order that any just conclusion be arrived at. The arguments in favor

of the practice may be found in almost any of the medical publications; the case against vaccination is stated by Tebb, 'A Century of Vaccination'; Tebb, 'The Recrudescence of Leprosy and its Causation'; White, 'The Great Delusion'; Oswald, 'Vaccination a Crime', the writings of Wallace, Crookshank, Creighton and the 'Minority Report' of the Royal Commission.

Vail, Theodore Newton, American telegraph and telephone official b Carroll County, Ohio, 16 July 1845. He was a pupil at the Morristown Academy, Morristown, N. J. He took up the study of medicine with an uncle, but at the end of two years gave up medicine to become a telegrapher in the office at Morristown. He became connected with a small office on the line of the Union Pacific Railroad Company, in Iowa, to which State his parents had removed, and from there entered the United States railway mail service in Washington, D. C., where he was assistant superintendent, 1873, assistant general superintendent, 1874, and superintendent of all the government lines of telegraph, 1875-78. In 1878 he became connected with Professor Bell in the telephone, and he did for Bell what his uncle, Alfred Vail, had done for Morse, perfected and made practicable a great invention. He remained in the telephone business in connection with Bell's patents, 1878-87, which led to the presidency of the American Telegraph and Telephone Company and the New York Telephone Company in 1907. He traveled in Europe for the benefit of his health, 1887-93, and was a farmer in Vermont, 1893-96. Connection with electrical enterprises in Argentina since 1896 enabled him to introduce the American electric system on street railways in Buenos Ayres and installed telephone systems in the principal cities of the Republic of Argentina. He also became a director in these corporations and in others in England and the United States. The Western Union Telegraph Company, of which Mr. Vail assumed the presidency, 23 Nov. 1910, as successor to Col Robert C. Crowley (q.v.) had during the last fiscal year transmitted more than 68,000,000 messages, while the American Telephone and Telegraph Company of which Mr. Vail was president handled 5,956,800,000. The lines of the Western Union included 1,382,509 miles of wire and those of the American Telegraph and Telephone Company comprised 8,098,678 miles, making the combined amount under Mr. Vail's presidency nearly 9,500,000 miles. The combined capitalization of the companies at the time was nearly \$700,000,000, and the gross earnings for the last current year exceeded

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\$170,000,000 Mr Vail caused to be inaugurated the popular night letter system and other innovations. Mr. Vail claims that the business is in no respect a trust but simply a combination of interests to enable the separate managements to practice greater economy and give better service to the public.

Valuation, Unit System of. See **TAX ASSESSMENTS, AUTOMATIC**; and **OHIO, History**, 1910.

Vanadium. In Sept. 1910 Prof Narcisse Alfred Helouis, a French scientist, came to the United States and established headquarters at Cambridge Springs, Pa., for the purpose of demonstrating to the physicians of this country his vanadium cure for tuberculosis. With this cure he obtained remarkable results in Paris, Berlin, London and other large foreign cities. Physicians gathered from all parts of the United States and Canada to see the cure in actual practice. Its most novel feature is that by it the oxygen that kills the bacilli is introduced directly into the patient's system. The cure results, Professor Helouis declares, from the easy breaking up of vanadium salts that give up their oxygen as a result of internal reactions. The oxygen rapidly kills disease-breeding germs and so checks the ailment permanently. The treatment may be of three kinds, namely Internal, through hypodermic injections, or external. Vanadium has shown further that it will kill the bacteria of other diseases besides tuberculosis, and will positively end all diseases due to defective nutrition. Professor Helouis began his chemical researches under the commission of Emperor Napoleon III in 1865, and since that time has been decorated many times for his therapeutic and purely scientific investigations. For almost half a century the value of vanadium, as an alloy in metals, has been known to scientific men, but Professor Helouis was the first to discover that this rare element could be successfully applied to the alleviation of human pain and disease. He believes that he is only at the beginning of his discoveries with vanadium, and that, after more extended experimenting, vanadium can be made to play a greater part in the practice of medicine than any other remedy since the discovery of anesthetics.

Vanderbilt Cup Race. See **AUTOMOBILE RACES**.

Van Devanter, Willis, associate justice of the United States Supreme Court: b Marion, Ind., 17 April 1859. He was graduated from Asbury (now De Pauw) University in 1878, and from the Cincinnati Law School, LL.B. 1881. He established himself in practice at Marion, where he remained for three years, when, in 1884, he removed to Cheyenne, Wyoming. He was appointed a commissioner to revise the statutes of the territory of Wyoming in 1886; city attorney, 1887-88; a member of the territorial legislature, and chairman of its judiciary committee in 1888; and in 1889 was appointed to the chief justiceship of the territory, holding the bench until Wyoming was admitted to the Union as a State, at which time he was elected chief justice of the State. In 1890 he resigned and resumed his practice of law. He was chairman of the Republican State Committee, 1892-94, a member of the

Republican National Committee, 1896-1900; and a delegate to the Republican National Convention of 1896. He was appointed Assistant Attorney-General of the United States by President McKinley, in 1897, and was assigned to the Department of the Interior. He was professor of equity, pleading, and practice at Columbian (now George Washington) University, Washington, D C, 1898-1903, and professor of equity jurisprudence, 1902-03. On 18 Feb 1903, he was appointed United States Circuit Judge of the Eighth Judicial Circuit, and in 1910 was appointed by President Taft an associate justice of the United States Supreme Court, and his nomination was confirmed without opposition by the Senate on 15 Dec 1910.

Van Dyke, Henry, American clergyman, author and educator: b Germantown, Pa., 10 Nov. 1852. His education was received at the Brooklyn Polytechnic Institute, at Princeton College and Theological Seminary, and at the University of Berlin. The degree of D.D. has been conferred by three American universities, and that of LL.D. by several American and foreign. He was ordained to the Presbyterian ministry in 1879, was pastor of the United Congregational Church at Newport, R I, 1879-83, pastor of the Brick Presbyterian Church, New York, 1883 to 1900, when he became professor of English literature at Princeton; moderator of the General Assembly of the Presbyterian Church in the United States in 1902-03. He resigned his professorship at Princeton late in 1910, and in December of the same year declined a re-call to the Brick Presbyterian Church whose pulpit he had been supplying, presenting the church with his services for the year 1910 "as a Christmas gift." He is a trustee of Princeton College, lecturer at Harvard, Yale and the University of Paris, and member of many literary societies, including the American Academy of Arts and Letters. His writings naturally fall into a threefold division; sermons and other distinctively religious books; literary appreciations and essays; and poems. Of the former perhaps the best known are 'The Reality of Religion' (1884), 'The Story of the Psalms' (1887); 'God and Little Children' (1890); and 'The Bible as It Is' (1893). Of the second division 'The Poetry of Tennyson' (1889) is probably one of the most authoritative and eloquent studies of the late Laureate ever written; while 'Little Rivers' (1896), and 'Fisherman's Luck' (1899) are charming out door sketches. 'The Builders and Other Poems' was a volume of verse published in 1897, 'The Toiling of Felix' in 1900, and 'The White Bees' (1909) are among his poems. Perhaps he is best known for his poetry, which is "artistic, has genuine imagination and is full of noble, ethical feeling." As an editor he has prepared 'The Gateway Series of English Texts'; 'Select Poems of Tennyson'; and 'Little Masterpieces of English Poetry.'

Vegetable Butters. A vegetable butter is a substitute for butter made from some exclusive vegetable oil or fat. Coconut oil, neutralized and deodorized, is the basis of the most widely used of these butters. It is white, with a crystalline texture, and if preserved from contact with light and air and variations of temperature so great as to make it melt and

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solidify alternately, it will keep for months. Its melting point is 78-79.5°F. Sometimes it is mixed with a small quantity of fluid oil which makes it malleable and a little yolk of egg which gives it a closer resemblance to butter made from cream, when used in cooking, the egg causing it to sputter and turn brown.

60,000 tons a year are now said to be made, 16,000 tons in three factories in Marseilles. It is called by various fanciful trade names, as cocose and vegetalin in France, palmin in Germany, and nocolin in England.

Another form of vegetable butter is made from cotton oil, and originated in the United States, where it is used as artificial lard, and to add to oleomargarin made of beef fat. In the Levant and India it is used by that part of the population whose religion forbids the use of animal matter in any form.

Other vegetable butters are made from the fats of chocolate and palmetto butter; they may be developed also from palm oil, Mourah oil, Illupé butter, Karité butter, and so on. In fact, there are numerous seeds which contain fatty substances which can be used in this way if the manufacture proves profitable.

Venezuela. A Republic of South America, situated in the northern part of the continent, stretching northwesterly along the Atlantic Ocean and the Caribbean Sea and bounded on the land side by Colombia, Brazil, and British Guiana.

Area and Population.—The area is 393,976 square miles, and the population about 2,664,241. The chief towns are Caracas (the capital), with 73,000 inhabitants; Maracaibo, 50,000 inhabitants; Valencia, 40,000, Margarita Island has 20,000 inhabitants.

Government and History.—"The United States of Venezuela" belongs to the South American Confederation. The executive of the Government is exercised by a President, with a cabinet of seven ministers, and a council of government. The President retains office four years; he must be a Venezuelan by birth, over 30 years of age; and cannot succeed himself. The members of the council of government—10 in number, one from each State,—are elected by Congress for a period of four years. The President's salary is \$12,000 per year, and that of the ministers is \$9,264. A Senate and a Chamber of Deputies compose the Legislature. There are 40 senators, elected by the Legislative Assemblies of the States for four years, two for each State, Venezuelans by birth and over 30 years of age. One deputy is sent from every 35,000 of the population, and an additional one for each additional 15,000. Congress meets in April each year. The local government is administered by governors for all of the 20 States, the two territories, and the federal district. There are state councils for the State, and municipal councils for the municipalities. The independence of Venezuela was declared in 1811, after ceaseless turmoil with Spanish oppressors. The first President of the Republic was Jose Antonio Paez. In 1909, the country adopted the constitution under which the government is now administered. The ancient history of Venezuela, which was discovered by Christopher Columbus in 1498, would be very interesting, no doubt, if a key to the glyphs adorning the ruins that bespeak a wonderful civilization, could be discovered.

Finance and Public Works.—The revenue for 1909-10 amounted to about \$10,000,000, and was counterbalanced by the expenditure. The principal sources of Government income were imports, surtax on imports, salt, liquor, and stamp taxes. The chief items of expenditure were the Interior, Foreign Relations, Finance and Public Credit, War and Marine, etc. During the fiscal year 1909-10, about \$2,411,000 was paid on the public debt. Among the public works of the country, a new cement wharf being built at Puerto Cabello, to cost \$17,575, deserves mention. The Government has contracted for the construction of a steel dock at that place, to be completed in July 1911, and to cost \$193,000. The Government contemplates the establishment of wireless stations at Pampatar, Coche, and Araya on Margarita Island, according to reports.

Justice and Education.—There are the High Federal Court, the Court of Cassation, courts of appeal, and minor courts, for the administration of justice. The seven justices of the Supreme Court are elected by the National Congress for a term of four years. The court meets annually. Total number of schools in Venezuela in 1909 reached about 1,543. Of that number, 1,014 with 32,141 pupils, were national; 146, with 4,817 pupils, federal, 225, with 7,537 pupils, municipal, 154, with 4,092 pupils, private, and second grade schools, 4, with 131 pupils. For advanced education there are The National Academy of Fine Arts, the School of Arts and Trade, the Central University at the capital, the University of Los Andes at Merida, the School of Engineering, and the Seminary of Theology and Canonical Jurisprudence. The Government expenditure on public instruction in 1909-10 amounted to \$854,700.

Production and Industry.—Coffee is one of the most important products of agriculture, it is grown on 200,000 acres, approximately. There are many cacao and sugar plantations. In the first eight months of 1909 the production of cacao was sufficient to warrant a shipment of 123,836 bags. Cotton is grown in considerable quantities; rubber and splendid timber enrich the forests. There are valuable mineral deposits throughout the country. Gold, copper, silver, iron and salt are mined successfully. Asphalt and coal are also mined. The coal mines of the State of Falcon are being exploited by Gen Leon Jurado. The coal output is more than 14,000 tons. Salt is a government monopoly, the yearly rental amounting to \$700,000. The livestock industry is important. In 1909, there were more than 6,000,000 cattle, 1,600,000 goats, and 1,600,000 swine. Pearl fisheries are carried on off Margarita island. There is a fine plant at Valencia for the manufacture of cotton. Plants for the storage of frozen meats are being arranged for by the Government.

Commerce.—The imports into Venezuela for 1908-09 amounted to the value of about \$9,836,100, and the exports abroad to the value of \$16,629,050. The increase in trade over the previous year was \$2,125,520. The three leading countries in Venezuelan import trade were Great Britain, supplying the value of \$2,997,930; United States, the value of \$2,854,000; and Germany, the value of \$2,375,600. The im-

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ports included, principally, calicos, cottons, coal, satine, bleached cotton, etc., from Great Britain, gold coin, wheat flour, drugs and medicines, leather, kerosene oil and hams, from United States; and rice, butter, felt hats and cotton stockings, from Germany. The 3 principal countries in Venezuelan export trade, for 1908-09, by countries of procedure, were: United States, receiving the value of \$7,446,200, France, the value of \$4,953,500; and Great Britain, the value of \$1,524,200. The leading articles of export and their respective values were coffee, \$6,054,420; cacao, \$3,624,800; balata gum, \$1,345,580; cattle hides, \$929,500; rubber, \$479,580; goatskins, \$295,100; gold, \$276,200, cattle, \$209,800, egret plumes, \$196,000; cotton seed, \$147,500; asphalt, \$148,700; divi-divi, \$139,640; deerskins, \$55,600, and gold coin, \$42,200.

Shipping, Railways, Posts and Telegraphs—There are 70 navigable rivers in the country, with a navigable length of 6,000 miles. The Orinoco river alone is navigable for nearly 4,000 miles. Ocean vessels enter Lake Maracaibo, which has an area of 8,000 square miles. Steamers carrying foreign merchandise entering the ports of Venezuela during 1909 numbered 659; sailing vessels, 280. About 250 vessels, in that year, entered the port of Al Guaira. The total length of railway line in operation is about 540 miles. There are 12 lines, with an invested capital of more than \$40,000,000. The railways are principally along the coast. The two chief towns of the country have railway connection with the interior, and in that way the best agricultural country finds exit for its trade. An automobile service is being established to different parts of the interior. The cost of keeping up the post-offices of the country for the fiscal year 1908-09 was \$65,500. There were 23 new offices established during the year, and nine new telegraph offices. Telegraph lines extend a total distance of 4,750 miles, or more. There is direct telegraphic communication between the capital of Venezuela and the capital of the Republic of Colombia.

History, 1910—With the inauguration of President Gomez in June 1910, Venezuela was promised a more stable and prosperous state of affairs than it had had for many years. Gomez agreed to undertake useful works and elevate Venezuela to a level reached by other nations by good faith in international dealings and obligations.

The summer passed in a period of reconstruction, but on 23 September a rupture occurred with Colombia and the Venezuelan delegation at Bogota was telegraphed to leave the country. There had been bad feeling between the two countries for years, and only 16 months earlier diplomatic relations had been resumed after years of open hostility. A treaty was to have been prepared covering the navigation rights and frontier customs, but nothing had come of it. Serious trouble was, however, avoided.

On 8 Oct 1910, invitations to participate in Venezuela's centenary were issued by a presidential decree. They were sent to Spain, Colombia, Ecuador, Peru, Bolivia, Great Britain, Haiti, the United States, Argentina, Brazil and Mexico. On the same day Gustavo Sanabria was appointed by the President minis-

ter plenipotentiary to negotiate a treaty with Colombia regarding the frontier.

Two days earlier occurred a general jail delivery at the fortress and prison on San Carlos Island in Lake Maracaibo. The troops conspired with the prisoners and helped them escape. Many of the prisoners were incarcerated on account of their allegiance to the cause of former President Castro. The American Red "D" Liner *Merida* arrived at the island on the morning of 7 October, and barely missed being seized by the escaped prisoners. Gen. Prato Gomez, brother to the President, escaped only by assuming a disguise. The soldiers' barracks and the Governor's house were burned.

A contract was entered into 24 November between the Government and Gen Delgado Chalbaud for the establishment of a new national bank having branches in all the principal cities of Venezuela. Provision was made for a capitalization of \$6,000,000, to which the Government subscribed one-half. A gold reserve of one-fourth the cash capital was stipulated, and the Government agreed to conduct all its monetary operations through the banks. Interest charge was limited to 8 per cent, although the prevailing rate at the time was 12 per cent. The organization was scheduled to go into effect 1 July 1911. Considerable confidence in Venezuela's future was expressed by the financing of this bank and it was understood that English bankers were backing General Chalbaud. In December, however, Charles M. Schwab, president of the Bethlehem Steel company, which owned all the stock in a company formed to operate iron mines in Venezuela, withdrew from the project because the Venezuelan Government would not guarantee freedom from dispossession or interruption by revolution or consequent litigation. Other American capitalists interested themselves in the matter, regardless of the governmental guarantee.

Ventilation. See HEATING.

Vermont. One of the States of the New England division, having a population of 355,956, a gain of 36 per cent over 1900. The population per square mile is 39. Its area is 9,564 square miles, of which 430 is water. The capital is Montpelier; population, 7,856.

Agriculture—The last available figures give the State 33,104 farms with an area of 4,724,440 acres, of which one-half have been improved. The acreage production and value of the important farm crops of the State for 1910 are as follows: Corn, 2,881,000 bushels, acreage, 67,000, value, \$1,901,000; spring wheat, 29,000 bushels, acreage, 1,000, value, \$30,000; oats, 3,528,000 bushels, acreage, 85,000, value, \$1,764,000; barley, 465,000 bushels, acreage, 15,000, value, \$316,000; rye, 35,000 bushels, acreage, 2,000, value, \$30,000; buckwheat, 192,000 bushels, acreage, 8,000, value, \$134,000; potatoes, 3,777,000 bushels, acreage, 29,000, value, \$1,696,000; hay, 1,256,000 tons, acreage, 930,000, value, \$15,574,000; tobacco, 320,000 pounds, acreage, 200, yield per acre, 1,600 pounds, value, \$46,400. The farm animals on 1 Jan. 1910 were as follows: Horses, 94,000, average price per head \$106, value, \$9,964,000; milch cows, 285,000, value, \$9,747,000; other cattle, 210,000, value, \$3,024,000; sheep, 229,000; value, \$916,000; sheep of shearing age, 180,000; average weight of

fleece, 6.5 pounds; per cent of shrinkage 51; wool washed and unwashed, 1,170,000 pounds, wool scoured, 573,300; swine, 95,000, average price per head \$10, value, \$950,000.

Mining and Manufacturing.—The leading mineral product of the State is marble, of which Vermont produces one-half of the country's output. The value of the product for the last year for which figures are obtainable was \$4,679,960. The State is also a great granite producing one, the value of the output being \$2,451,533. The stone production surpasses that of Pennsylvania, and slate is also mined to a great extent. Other mineral products are those of clay, lime, metallic paint, sand and gravel, talc, and soapstone, the total of which for the last years had a value of \$9,313,120. The capital employed in the manufactures of the State amounted to \$62,658,741, and the value of the product was \$63,083,611; the wages paid amounted to \$15,221,059, and the number of wage earners was 33,106. Much of the manufacturing industries have to do with flour-milling, foundry and machine shop work. Hosiery and woollens are also manufactured to a great extent. The wood pulp, timber and lumber trade are stimulated by the forests of the State.

Government.—The Governor of Vermont is John A. Mead, Republican; salary, \$2,500, term two years which expires in Oct 1912. Other State officers are: Lieutenant-Governor, Leighton P. Slack; Secretary of State, Guy W. Bailey; Treasurer, Edward H. Deavitt; Auditor, Horace F. Graham; Attorney-General, J. G. Sargent. The composition of the State Legislature is as follows: Senate—Republicans, 30; Democrats none. House—Republicans, 106; Democrats, 48; Independent Democrats, 2. The United States Senators are William P. Dillingham and Carroll S. Page, Republicans. The two representatives in Congress are David J. Foster and Frank Plumley.

Finance.—The bonded debt of the State is \$135,000. The valuation of real property is \$143,386,564, and personal \$45,106,982. The tax rate is \$3.50 per thousand. The total indebtedness of cities, counties and minor civil divisions of the State is \$4,853,828. According to the last available figures, the annual receipts of the State were \$1,823,390, and the disbursements \$1,871,166. There are 47 National banks with 21,830 depositors, and \$7,544,364.18 deposits; 23 loan and trust companies, with 52,135 depositors and \$18,878,526.35 deposits. There are 108,298 depositors in the savings banks, with deposits amounting to \$43,132,268.04.

Religion and Education.—The leading religious denominations are as follows: Roman Catholic, 40,070 males and 41,395 females; Methodist, 6,140 males and 11,219 females; Congregationalist, 7,357 males and 14,752 females; Baptist, 3,535 males and 6,117 females. The pupils enrolled in the schools number 65,781, and their average daily attendance is 48,606. The teachers number 3,915. There are three universities and colleges, with 113 male instructors, and 768 male and 178 female students. Their total income derived from tuition fees, productive funds and from the Government is \$291,626, and the value of the buildings is \$1,128,000. In 1909 the county system for examinations for teachers was abolished, and they are now conducted by union superintendents. The sum of \$1,607,654 was expended

for education during the last year in which figures are available.

Charities and Corrections.—The State has 23 benevolent institutions composed of nine hospitals, five orphan asylums, and nine homes for adults and children. There is a soldiers' home at Brattleboro, a State hospital for the insane, and house of correction and State prison. The Governor is commissioner of the deaf, dumb, blind, idiotic, feeble-minded, or epileptic children of indigent parents. Pittsford has a sanitarium for consumptives. The almshouses are under the jurisdiction of overseers in each town. A pauper to obtain relief must show a residence of three years. The last available figures give the almshouses 425 pauper inmates, of which 11 are colored.

Legislation.—The Legislature meets biennially, the last session being in 1909, at which acts were passed creating a State board of agriculture and forestry, and providing for the inspection of nursery stock brought into the State; improving and extending the educational system, making provision for the better enforcement of child-labor law; help to town libraries; and appropriations for permanent highways, simplifying the adjustment of fire insurance losses, creating a public service commission, clothing cities and towns with power to compel pure milk supply; a measure for protection against the spread of tuberculosis, regulating the practice of medicine and surgery but not making it apply "to persons who merely practice the religious tenets of their church without pretending a knowledge of medicine or surgery."

Victoria. A territory in the southeast of the Commonwealth of Australia, formerly part of New South Wales.

Area and Population.—The area is about 87,880 square miles, and the estimated population is 1,297,550. In 1901 there were about 113,400 English in the population; 61,500 Irish; 35,750 Scotch; 3,700 Welsh; 6,350 Chinese; and other nationalities; the native Victorians numbering about 876,000. The birth-rate in Victoria is 2.45 per cent and the death-rate 1.12 per cent of the population. The chief town is Melbourne, with a population of 562,300. Other towns are Ballarat, 46,600; Bendigo, 44,100; Geelong, 28,900; Castlemaine, 8,500; Warrnambool, 6,700; and Maryborough, 5,950.

Government and Finance.—There is a Governor, appointed by the crown, assisted by an Executive Council of 11 members, and a Parliament consisting of a Legislative Council of 34 members and an Assembly of 65 members from as many administrative divisions of the country. The latest available statistics place the revenue at \$40,207,450, and the expenditure at \$40,170,850. The debt in 1909 amounted to about \$266,015,000.

Agriculture and Industries.—About 4,834,285 acres were under cultivation in 1909-10; 2,097,160 being under wheat crops; 384,225 under oats, and 864,350 devoted to the hay crop. Wine produced in that year measured 991,950 gallons. Livestock included 625,060 milch cows, producing 55,166,550 pounds of butter and 5,025,840 pounds of cheese. Wool, gold, wheat, flour, biscuit and butter are the leading products of Victoria. The mining industry is valuable, the State being one of the best in the production of gold. The amount of the

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gold output in 1909 was about 702,220 ounces, and the value of the production of other minerals (tin, copper, coal, antimony, etc.) was about \$33,587,250. Building stone quarried in that year was worth about \$18,600,000.

Trade, Shipping, and Communications—The trade in 1909 was about as follows: Imports: wool, \$17,025,000; livestock, \$8,790,000; sugar and molasses, \$4,065,000; gold, \$7,730,000; cottons, \$6,930,000; woolens, \$4,520,000, and timber, \$3,910,000. Exports: wool, \$35,310,000; gold, \$14,230,000; butter, \$6,825,000; wheat, flour and biscuit, \$18,365,000; oats, \$765,000; leather, \$2,240,000; hides and skins, \$5,815,000; and livestock, \$5,835,000. The total amount of the imports for the fiscal year ending June 1909 was \$137,232,500, and of the exports, \$145,744,300. There were in that year about 3,450 miles of railway line in operation, all government-owned. The revenue derived therefrom amounted to about \$20,945,000, and the working expenses of keeping up the line to about \$12,615,000; leaving a net income of about \$8,330,000. In that year there were 56,950 miles of telephone wire, and there were 1,260 stations for electric telegraphs, covering 7,160 miles of line. The revenue for 1909 amounted to about \$675,000, and the messages transmitted numbered 2,556,600. There were 4,600 vessels (approximately) to visit the ports in 1909, carrying about 9,056,770 tons. Postal services are up-to-date.

Vinton, Alexander Hamilton, first P. E. bishop of Western Massachusetts and 26th in succession in the American episcopate. b. Brooklyn, N. Y., 30 March 1852. He was educated for the ministry of the Protestant Episcopal Church, graduating at St. Stephens College, Annandale, N. Y., A. B. 1873, and S. T. B. 1876. He then pursued graduate studies at the University of Leipzig and was admitted to the diaconate in 1876 and advanced to the priesthood in 1877 by Bishop Starkey, of the Diocese of Newark, and was rector of the Church of the Holy Communion, Norwood, N. J., 1878; of the Church of the Holy Comforter (Memorial), Philadelphia, Pa., 1879-84; All Saints' Church, Worcester, Mass., 1884-1902; and, in Jan. 1902, he was elected the first bishop of the newly erected diocese of Western Massachusetts and was consecrated in All Saints' Church, Worcester, Mass., 22 April 1902. While a member of the clergy of the diocese of Massachusetts, he was a member of the Church Congress and its vice-president, a trustee of the General Theological Seminary, New York, and of Smith College, Mass.; examining chaplain of the diocese; preacher and member of the standing committee of the same diocese; besides being a delegate to the General Convention, 1898 and 1901. He was given the honorary degree of D. D. in 1890, and the degree of LL. D. by St. Stephens and by the General Theological Seminary in 1902.

Virginia. A State of the South Atlantic division having a population of 2,061,612, a gain of 11.2 per cent over 1900. The population per square mile is 51.2 per cent. The area is 42,267 square miles. The capital is Richmond, population, 127,628.

Agriculture—The latest figures of the farm area were 19,907,883 acres, of which about one-half were improved. The acreage production and value of the important farm crops of the

State for 1910 were as follows: Corn, 54,621,000 bushels, acreage, 2,142,000, value, \$35,504,000; winter wheat, 10,176,000 bushels, acreage, 795,000, value, \$9,871,000; oats, 4,268,000 bushels, acreage, 194,000, value, \$2,091,000; barley, 88,000 bushels, acreage, 3,000, value, \$59,000; rye, 270,000 bushels, acreage, 20,000, value, \$216,000; buckwheat, 378,000 bushels, acreage, 21,000, value, \$291,000; potatoes, 6,566,000 bushels, acreage, 67,000, value, \$3,808,000; hay, 565,000 tons, acreage, 475,000, value, \$8,192,000; tobacco, 124,800,000 pounds, acreage, 160,000, value, \$11,232,000. Virginia ranks next to Kentucky as a tobacco-producing State. The farm animals of the State, on 1 Jan. 1910, were as follows: horses, 323,000, value, \$34,561,000; mules, 54,000, value, \$7,020,000; milch cows, 297,000, value, \$8,821,000; other cattle, 578,000, value, \$11,213,000; sheep, 522,000, value, \$2,036,000; number of sheep at shearing age, 365,000; average weight of fleece, 4.5 pounds; per cent of shrinkage 38; wool washed and unwashed, 1,642,500 pounds; wool scoured, 1,018,350; number of swine, 774,000, average price per head \$6.50, value, \$5,031,000.

Mining and Manufacturing—The value of the mineral products of the State is \$13,127,395, which is an increase over the previous year. The leading minerals are coal and iron. The coal production was 4,570,341 tons, of the value of \$8,244,614. There were employed in the mines 6,208 men. The manufacture of coke was conducted in 19 establishments with 4,853 ovens, and 158 additional ones are at present under construction. The output was 1,162,051 short tons of coke, valued at \$2,121,980. There is a very small production of gold amounting to 118.57 fine ounces, valued at \$2,451, and some silver. The copper mined amounted last year to 24,775 pounds, valued at \$3,270. Other minerals found are as follows: zinc, 1,410,961 pounds, value \$66,316; lead, 76,190 pounds, and clay products with a value of \$1,499,130. Talc and soapstone, pyrite, mineral waters, ores, barytes, slate, sand and gravel, are also found. The capital employed in the manufacturing establishments amounts to \$147,989,182, value of the products, \$148,856,525; wages paid, \$27,943,058; wage earners, 80,285. Tobacco is the leading industry, capital invested, \$23,477,649, value of output, \$16,768,204; cost of raw material, \$6,663,585; wage earners, 7,931. Textiles come next in point of importance; capital invested, \$8,829,052, value of output, \$7,841,519; cost of raw material, \$4,887,382; wage earners, 5,947. Other important industries are lumber and timber, flour and grist, iron and steel, leather tanning, and printing and publishing.

Fisheries—The fishing industry of the State gives employment to 20,066 people. There are 946 vessels valued at \$1,322,104, and 10,942 boats valued at \$733,360. The value of the products is \$4,715,744. Oysters are the most important, the product being 3,672,100 bushels; value, \$1,966,660. The shad catch was 7,314,400 pounds; value, \$486,070; menhaden, 190,089,200 pounds; value, \$429,060; squeteague or trout, \$139,000; hard crabs, \$238,950; soft crabs, \$86,500; croakers, \$118,810; alewives, \$170,840; and Spanish mackerel, \$24,720.

Government—The Governor of the State is William Hodges Mann, Democrat; salary \$5,000 a year; term four years, which will expire 1 Feb. 1914. The Lieutenant-Governor is J. T. Ellyson; Secretary of the Common-

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wealth, B. O. James; First Auditor, Morton Marye; Treasurer, A. W. Harman, Jr.; Attorney-General, Samuel W. Williams. The composition of the State Legislature is as follows: Senate—Democrats, 34, Independents and Republicans, 6 House—Democrats, 87, Republicans, 13. The United States Senators are Thomas S. Martin and Claude A. Swanson. The Representatives in Congress are William A. Jones, Edward E. Holland, John Lamb, R. Turnbull, E. W. Saunders, Carter Glass, James Hay, Charles C. Carlin, Henry D. Flood, all Democrats and C. Bascom Slemp, Republican.

Finance—The bonded debt of the State is \$24,986,959 and the valuation of the real property \$678,321,068, personal property \$111,591,929, and the tax rate is \$3.50 per 1,000. The debts of the cities, counties and minor civil divisions aggregate \$23,934,462. The receipts were \$5,851,146, and the disbursements \$5,063,430. There are 111 National banks, with 45,542 depositors, and \$20,852,644.81 deposits; 151 State banks with 43,648 depositors, and \$11,625,921.35 deposits; one private bank with 473 depositors, and 139,762 deposits; five loan and trust companies with 4,992 depositors and \$1,243,161.21 deposits; and 32,217 depositors, with \$8,179,974.45 deposits in the savings banks of the State.

Religion and Education—The largest religious denomination of the State is the Baptists, with 158,962 males and 236,191 females. The Methodists number 74,872 males and 110,201 females. Some of the other religious denominations are the Roman Catholics, 14,384 males and 14,316 females, Presbyterians, 14,148 males and 23,187 females, and Disciples or Christians, 7,248 males, and 10,067 females. The total State and local school funds amount to \$4,400,343.18. The salaries of teachers aggregate \$2,017,133.13, and there were expended on real estate and buildings \$936,751.81, repairs to buildings, \$100,551.74, books for indigent children, \$3,030.62, and miscellaneous expenditures of \$211,357.07. The white schools numbered 7,570, and the colored 2,370. The white males enrolled numbered 141,357, and the females 135,479; the colored males 55,164, and females 62,413. The average daily attendance is as follows: white males, 92,505; white females, 92,555; colored males, 33,243; females, 39,424. There are 214 high schools in the State, and the total amount of the High school funds is \$96,373. The number of children studying high school branches in both high and grammar schools are, white, 18,561; colored, 1,405.

Charities and Corrections.—There are 77 charitable institutions, of which 27 are orphan asylums, 1 day nursery, 19 hospitals, and 2 dispensaries, 27 homes, and a State school for the deaf and blind. The almshouses are under the control of the overseers and town councils, the almshouse population for the last year figures were available was 1,955, of which 883 were colored. There was spent on the penitentiary the sum of \$125,211.64, of which \$35,219.93 was for provisions, and \$39,777.88 for guards. The clothing cost \$8,026.38. The number of convicts in the penitentiary were, white, 190; colored, 1,041; white women, 4; colored women, 90. The State farm had 49 white and 221 colored men.

Legislation.—The legislature meets in biennial session which is limited to 60 days. At its 1910 session, measures were passed pro-

viding for the distribution of preventive serum for hog cholera, creating a board for the examination and registration of dentists, and another for public chartered accountants, making it a misdemeanor for parents or guardians to refuse to support children under 14, proposing small amendments to a constitution adopted 10 years ago, making it a misdemeanor to swear over the telephone or to abuse a person or his female relatives in such a manner as to lead to a breach of the peace; making it larceny to refuse to pay for or redeliver goods received COD within 24 hours or to obtain money or property on bad checks or drafts; prohibiting the use of opium in cigarettes or their wrappers; requiring a report of all diseases listed by the State Board of Health as contagious, ordering passengers to take seats pointed out to them by the conductor; requiring separate valuation of timber owned otherwise than by the land owners.

History, 1910—There is pending in the United States Supreme Court an action against West Virginia for \$11,000,000, one-third of the old State debt before the Civil War. West Virginia claims she owes no part of this debt, which was created before she became a separate State. Ex-Senator John C. Spooner of Wisconsin is leading counsel for West Virginia. The matter has now been argued before the United States Supreme Court. There was an explosion of high power nitro-glycerine on the Monitor Puritan, 15 Nov 1910, which left the ship in a sinking condition. It was rushed to the Norfolk Navyyard.

Virgin Islands. Islands in the British West Indies, with an area of about 201 square miles, and a population in excess of 28,000. Some of the Virgin Islands are occupied by the Danes and the Spanish, the latter owning Crab Island, but Britain controls the principal portion of the group. The seat of administration is Roadtown, on Tortola Island. The population is about 400. The Government is in the hands of a Nominated Executive Council, amenable to the Governor-General of the Leeward Islands, of which Protectorate the Virgin group forms a part. The revenue amounted to about \$21,000, and the expenditure to about \$23,500, according to last Government returns. The imports into the islands were valued at \$43,300, and the exports abroad at about \$35,500. The chief resources of the Virgin Islands are sugar and cotton industries, carried on by peasant proprietors, principally.

Vital Statistics. The study of vital statistics has become such a highly developed science in the United States that it can be foretold with accurate approximation how many persons out of each hundred will die in the course of a year, or even a given month, in any community of any size in more than half of the United States, together with the diseases of which they are most likely to die. It has been prognosticated that 1,407,065 persons will pass away within the borders of the United States in the course of the forthcoming year, which means that 15 out of every 1,000 persons in this country will not live to see New Year's Day 1912. Of this number of deaths, 19 out of every 100 will be babies as yet unborn, while, according to the estimate, 26.8 per cent of the total will be made up of children under the age of five years. Out of the 1,407,065 persons expected

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to die during the forthcoming year, 109,750 will pass away between the ages of 20 and 30 years. This represents an average of a little more than one out of every 1,000 deaths. Only a few more deaths per 1,000 will be suffered by persons between 30 and 40, and the percentage will be but slightly greater for those between the ages of 40 and 50. Within the next decade of life the chances of death show an increase, estimates indicating that 142,113, or 1.6 persons out of every 1,000, will probably die during 1911, more than 10 per cent of the total death rate being thus sustained by persons between these ages. Of persons between 60 and 70 years, 1.83 out of every 1,000, a total of 171,611, will die. This number represents 12.2 per cent of the total death list. The remaining three deaths in every 1,000 will be accounted for by persons who have passed beyond any of these ages.

A half a century's careful work in preparing vital statistics has shown the United States Census Bureau that 75 per cent of all the deaths occurring in this country are traceable to only 21 different causes. These are as follows: (1) Tuberculosis; (2) heart disease; (3) intestinal troubles (chiefly in children); (4) pneumonia; (5) nephritis; (6) Bright's disease; (7) accident; (8) cancer; (9) apoplexy; (10) broncho-pneumonia; (11) premature birth; (12) congenital debility; (13) old age; (14) bronchitis; (15) typhoid fever; (16) diphtheria and croup; (17) diseases of the arteries; (18) suicide; (19) diseases of the stomach; (20) meningitis; and (21) child birth. These are listed in the order of the number of victims which each will claim. Tuberculosis is the most severe of all, 11 out of every 100 of the 1911 deaths being traced to that source by the statistical experts. Heart disease will not be far behind, claiming 9 out of every 100. Seven and a fraction out of every 100 deaths will be accounted for by intestinal troubles, practically all of this number being children under 10 years of age. Considered together, pneumonia, nephritis and Bright's disease will be responsible for 13 out of every 100 deaths, that percentage being about equally divided between the first mentioned and the two latter. Still considering the subject on the basis of every 100 deaths, accident will account for six and a fraction, cancer five and a fraction, and apoplexy almost as many. Broncho-pneumonia will claim 2.9 persons; premature birth 2.5; congenital debility 2.1, and old age 1.8. Bronchitis closely follows old age, while typhoid fever is almost equally malignant, with diphtheria, croup and diseases of the arteries close behind, followed by suicide which will account for 1.2 persons out of every 100 who will leave this life during 1911. The other 1.1 from each 100 will be accounted for by stomach disease, meningitis and child-birth.

During the year 1909, from all the various causes, 308,597 male and 333,941 female persons died in the registration area of the United States. This makes a grand total of 732,538 persons, of which 93.7 per cent were white and 6.3 per cent colored; 24.4 per cent foreign; 1.4 per cent of unknown birth; and the balance native American. The largest number of deaths returned for any month during 1909 was 70,093, occurring in March. This month has been found to regularly return the greatest number of deaths, while June has the lowest

percentage. The birth-rate during the same year for New York City, the greatest centre of population in the United States, was 130.705.

For the fiscal year 1910 the births recorded in the chief cities of the United States were as follows: Albany, N. Y., 1,342; Atlanta, Ga., 2,674; Auburn, N. Y., 633; Augusta, Ga., 677; Baltimore, Md., 8,796; Boston, Mass., 17,694; Brockton, Mass., 1,446; Buffalo, N. Y., 9,027; Cambridge, Mass., 2,864; Camden, N. J., 2,400; Charleston, S. C., 1,011; Chicago, Ill., 51,585; Cleveland, O., 13,100; Columbus, O., 3,154; Dayton, O., 2,327; Detroit, Mich., 10,845; Duluth, Minn., 1,855; Elizabeth, N. J., 1,388 (for 1909); Elmira, N. Y., 559; Erie, Pa., 1,623; Evansville, Ind., 1,145; Fitchburg, Mass., 1,155; Galveston, Tex., 816; Grand Rapids, Mich., 2,600; Harrisburg, Pa., 1,201; Hartford, Conn., 2,451; Haverhill, Mass., 928; Hoboken, N. J., 1,063; Holyoke, Mass., 1,640; Johnstown, Pa., 1,418; Kansas City, Mo., 4,005; Los Angeles, Cal., 5,180; Lowell, Mass., 2,621; Memphis, Tenn., 2,584; Milwaukee, Wis., 9,340 (for 1909); Minneapolis, Minn., 5,710; Nashville, Tenn., 1,780 (for 1909); Newark, N. J., 9,583; New Bedford, Mass., 3,825; New Haven, Conn., 3,650; Newton, Mass., 809; New York, N. Y., 130,765; Norfolk, Va., 1,138; Oakland, Cal., 2,230; Omaha, Neb., 2,350; Pawtucket, R. I., 1,081; Philadelphia, Pa., 37,540 (for 1909); Pittsburgh, Pa., 13,067; Portland, Ore., 3,022; Providence, R. I., 5,608; Reading, Pa., 2,302; St. Joseph, Mo., 1,160; St. Louis, Mo., 15,813; St. Paul, Minn., 4,125 (for 1909); Salem, Mass., 1,187; Salt Lake City, Utah, 2,120; San Antonio, Tex., 1,556; San Francisco, Cal., 6,671; Scranton, Pa., 4,000 (for 1909); Schenectady, N. Y., 1,801; Seattle, Wash., 3,013 (for 1909); Somerville, Mass., 1,708; South Bend, Ind., 1,602; Syracuse, N. Y., 2,604; Tacoma, Wash., 1,414; Taunton, Mass., 916; Troy, N. Y., 806 (approximate); Terre Haute, Ind., 2,015; Utica, N. Y., 1,737; Washington, D. C., 3,322; Waterbury, Conn., 2,280; Wilkesbarre, Pa., 1,933; Wilmington, Del., 2,072; Worcester, Mass., 3,773 (for 1909); Youngstown, O., 1,648.

The deaths in the principal cities of the United States for the fiscal year 1910 were as follows: Albany, N. Y., male, 808, female, 848; Atlanta, Ga., male, 1,058, female, 1,044; Auburn, N. Y., male, 288, female, 259; Augusta, Ga., male, 352, female, 330; Baltimore, Md., male, 5,394, female, 4,982; Boston, Mass., male, 5,793; female, 5,270; Brockton, Mass., 710 (total); Buffalo, N. Y., male, 3,335, female, 2,776; Cambridge, Mass., 1,850 (total); Camden, N. J., 7,279 (total); Charleston, S. C., male, 629, female, 731; Chicago, Ill., male, 17,874, female, 13,426; Cleveland, O., 7,032 (total); Columbus, O., male, 1,095, female, 932, non-resident, 471; Dayton, O., male, 871, female, 776; Detroit, Mich., 6,437 (total); Duluth, Minn., male, 623, female, 367; Elizabeth, N. J., 1,245 (total for 1909); Elmira, N. Y., male, 293, female, 258; Erie, Pa., male, 566, female, 439; Evansville, Ind., male, 493, female, 460; Fitchburg, Mass., male, 306, female, 248; Galveston, Tex., male, 295, female, 224; Grand Rapids, Mich., 1,414 (total); Harrisburg, Pa., male, 529, female, 425; Hartford, Conn., male, 805, female, 654; Haverhill, Mass., 665 (total); Hoboken, N. J., 1,164 (total); Holyoke, Mass., 1,098 (total); Johnstown, Pa., male, 556, female, 371; Kansas City, Mo., male, 2,208, female, 1,578; Los Angeles, Cal., male, 2,554, female, 1,718; Lowell, Mass.,

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male, 921, female, 964; Memphis, Tenn., male, 1,351, female, 995; Milwaukee, Wis., male, 2,225, female, 2,661 (for 1909); Minneapolis, Minn., male, 1,770, female, 1,379; Nashville, Tenn., male, 981, female, 1,009 (for 1909); Newark, N. J., male, 2,968, female, 2,561; New Bedford, Mass., 1,779 (total); New Haven, Conn., male, 1,206, female, 1,015; Newton, Mass., male, 211, female, 232; New York, N. Y., male, 40,333; female, 33,772; Norfolk, Va., male, 675, female, 645; Oakland, Cal., male, 1,030, female, 870; Omaha, Neb., male, 1,023, female, 783; Pawtucket, R. I., male, 424, female, 394; Philadelphia, Pa., male, 4,715, female, 3,624; Portland, Ore., male, 1,079, female, 795; Providence, R. I., male, 3,535, female, 1,719; Reading, Pa., male, 786, female, 635; St. Joseph, Mo., male, 549, female, 406; St. Louis, Mo., 9,796 (total); St. Paul, Minn., male, 1,367, female, 1,049 (for 1909); Salem, Mass., male, 371, female, 366; Salt Lake City, Utah, male, 665, female, 614; San Antonio, Tex., male, 710, female, 683; San Francisco, Cal., male, 3,788, female, 2,366; Scranton, Pa., male, 727, female, 876; Schenectady, N. Y., male, 468, female, 394; Seattle, Wash., male, 1,306, female, 919 (for 1909); Somerville, Mass., male, 471, female, 517; South Bend, Ind., male, 442, female, 326; Syracuse, N. Y., male, 1,034, female, 914; Tacoma, Wash., male, 461, female, 438; Taunton, Mass., 796 (total); Troy, N. Y., male, 744, female, 693 (approximate); Terre Haute, Ind., male, 483, female, 391; Utica, N. Y., male, 707, female, 682; Washington, D. C., male, 3,322, female, 2,894; Waterbury, Conn., male, 590, female, 550; Wilkesbarre, Pa., 1,106 (total); Wilmington, Del., male, 721, female, 641; Worcester, Mass., 2,448 (total for 1909); Youngstown, O., male, 670, female, 460.

The number of marriages recorded in the most important cities of the United States during the fiscal year 1910 were as follows: Albany, N. Y., 799; Atlanta, Ga., not recorded; Auburn, N. Y., 400; Augusta, Ga., 106 (for 1909); Baltimore, Md., 5,239; Boston, Mass., 8,596; Brockton, Mass., 592; Buffalo, N. Y., 3,777; Cambridge, Mass., 1,208; Camden, N. J., 2,978; Charleston, S. C., 476; Chicago, Ill., 26,360; Cleveland, O., 5,357; Columbus, O., 2,163; Davenport, Ia., 688; Dayton, O., 1,652; Detroit, Mich., 5,345; Duluth, Minn., 923; Elizabeth, N. J., 684 (for 1909); Elmira, N. Y., 432; Erie, Pa., 918; Fitchburg, Mass., 354; Galveston, Tex., 602; Grand Rapids, Mich., 1,724; Harrisburg, Pa., 1,348; Hartford, Conn., 861; Haverhill, Mass., 463; Hoboken, N. J., 1,800; Holyoke, Mass., 633; Johnstown, Pa., 194; Kansas City, Mo., 3,000; Los Angeles, Cal., 5,059; Lowell, Mass., 1,100; Memphis, Tenn., 3,096; Milwaukee, Wis., 3,850; Minneapolis, Minn., 3,510; Nashville, Tenn., 1,600 (approximate for 1909); Newark, N. J., 4,155; New Bedford, Mass., 1,123; New Haven, Conn., 1,346 (for 1909); Newton, Mass., 406; New York, N. Y., 40,402; Norfolk, Va., 450; Oakland, Cal., 2,527 (for 1909); Omaha, Neb., 2,084; Pawtucket, R. I., 700; Philadelphia, Pa., 9,461; Portland, Ore., 2,907; Providence, R. I., 2,675; Reading, Pa., 905; St. Joseph, Mo., 1,302; St. Louis, Mo., 7,445; St. Paul, Minn., 2,250 (for 1909); Salem, Mass., 370; Salt Lake City, Utah, 2,062; San Antonio, Tex., 1,695; San Francisco, Cal., 4,070; Schenectady, N. Y., 507; Seattle, Wash., 3,289; Somerville, Mass., 833; South Bend, Ind., 617; Syracuse, N. Y., 1,000; Tacoma, Wash., 1,273;

Taunton, Mass., 411; Troy, N. Y., 625 (approximate); Terre Haute, Ind., 909; Utica, N. Y., 700; Washington, D. C., 3,971; Waterbury, Conn., 600; Wilkesbarre, Pa., 2,805; Wilmington, Del., 2,908; Worcester, Mass., 1,484 (for 1909).

The national figures compiled for 1909 represented an encouragingly low death rate throughout the country, the statistics for 1910 are almost equally as good. The provisional statement of the Census Bureau showed that 611,639 deaths had occurred in the registration area of the United States during 1910, of which number 518,404 were from the registration States. When the full death returns for 1910 reach the Census Bureau, which will probably not be until well along in 1911, it is expected that the total for the entire registration area will be about 780,000 deaths. Comparison of the provisional death rates per 1,000 of population for 1910 with the death rates per 1,000 of population in 1909, for those States in which about 80 per cent of the deaths for 1910 have already been returned, is as follows: California, 13.5 in 1910 and 13.4 in 1909; Connecticut, 15.6 in 1910 and 15 in 1909; Indiana, 13.4 in 1910 and 12.9 in 1909; Maine, 16.7 in 1910 and 15.6 in 1909; Massachusetts, 16 in 1910 and 15.4 in 1909; Michigan, 14.4 in 1910 and 13.1 in 1909; New Hampshire, 16.7 in 1910 and 16.9 in 1909; New Jersey, 15.5 in 1910 and 14.7 in 1909; New York, 16.2 in 1910 and 15.7 in 1909; Pennsylvania, 15.6 in 1910 and 14.7 in 1909; Wisconsin, 11.8 in 1910 and 11.8 in 1909. The total number of deaths in the District of Columbia during 1910 was 6,513 as against 6,216 in 1909, representing a death-rate per 1,000 of population of 19.6 and 19, respectively. The Census Bureau is also at present instituting a crusade for the better registration of births in this country, a matter in which the United States is lamentably lax and behind the other nations of the world. At the present time a bill providing for the better registration of births in the District of Columbia is before Congress, and it is hoped that this may become a model for every State in the Union, so that before long the national birth statistics may reach at least the same standard of accuracy now enjoyed by the death registrations.

The death-rate per thousand in the United States seems to be improving from year to year, and last year it was lower than ever before. The official figures proved that it dropped to 15 per thousand of population. This is lower than any previous year of registration, and probably is the lowest that ever occurred in the history of the country. In 1908, the death rate was 15.4 per thousand. The Census Bureau's Bulletin, containing these figures, mentions the fact that the general prevalence in 1909 of favorable conditions for human life seems to be international. Thus, the death rate of England and Wales for that year was 14.5 per thousand, which was the lowest on record for that country, while the rate of 14 for the city of London was even lower, and demonstrates the fallacy of the belief that high death-rates are necessarily found in large cities.

Of the total number of 732,538 deaths during 1909, in the death registration area, which represents a fraction of over 55 per cent of the provisionally estimated population of continental United States, no less than 196,534,

VIVISECTION

or 26.8 per cent, were of children under 5 years old, and 150,057, or 19.1 per cent, were of infants under 1 year old. "A great part of these deaths of children were entirely preventable and the causes which produced them are not being successfully combatted," the Bulletin says.

St. Paul, Minn., is credited with the lowest death-rate for the year—11.4 per thousand of the population. The highest death-rate was reached by New Orleans—20.2 per thousand. Next was Fall River, Mass., with 19.1; and then Washington, D. C., with 19.0.

Prof. J. Pease Norton, of Yale, recently published some statistics in the *Popular Insurance Magazine*, which are astonishing. He says that there are 4,200,000 sick in the United States at the present time; that 1,500,000 will die within the year; that 5,000,000 homes or 25,000,000 people, a quarter of the country's population, are more or less wretched because of sickness and death, that one out of every 12 persons living to-day will die from tuberculosis. These facts were pointed out, not to alarm the people, but to stir them into action. Doctor Norton pointed out, further, that the U. S. Department of Agriculture spends about \$7,000,000 a year to promote plant and animal health; but that human life is not similarly guarded and protected from disease.

During the past year, 81,720 people died from tuberculosis; 70,033 from pneumonia; the two together killed 311 out of every 100,000 of the population. From the purely monetary side of the question, it will be seen that this is an enormous loss to the country—as each individual life is valued by the State as worth about \$1,700. A large percentage of all these deaths could have been prevented by greater care, since the cause of most of them are preventable.

Vivisection. A great deal of agitation, pro and con, has been created of late years concerning this question of vivisection, and indeed it is a most difficult problem to settle, for the reason that there is a certain amount of right on both sides—to which the opposite side is unwilling to listen. The exponents of vivisection—of whom Doctor Carrel of the Rockefeller Institute may be considered the head—contend that many valuable results are obtained in this manner, which can be ascertained in no other way. The anti-vivisectionists, on the contrary, contend that no results have ever been obtained which could not have been discovered without resorting to vivisection. Some remarkable results have doubtless been secured by means of vivisection; the question is—are they necessary? Many valuable facts have doubtless come to light; but it is felt that they could have been learned in some other way. Answers to these questions have been varied, according to the standpoint of the individual. There can be no doubt that, morally, vivisection is to be deprecated, unless, as the outcome of a few experiments, such important results can be obtained that the human race is thereby benefited in consequence. In the past, it is doubtless true that much concerning the structure and functions of the human brain has been learned in this manner—facts which might, it is true, have been ascertained in other ways, but years might have elapsed before the same knowledge was attained, which was secured in a few hours

by the method of vivisection. On the other hand, it is unquestionably true that much useless experimentation goes on, in various laboratories, of an excessively cruel kind, and which benefits no one. The extent of vivisection should doubtless be restricted to a few competent men, who wish to arrive at definite results; and promiscuous and wide-spread vivisection should be debarred. Let us now see the results of some of the most important experiments of the kind, trace their outcome and, if possible, their value.

In the *Journal of Experimental Medicine*, published by the Rockefeller Institute, Jan. 1908, the results of 14 experiments on cats were published—in transplanting kidneys. Two of these animals died soon after the operation; three others died almost immediately of shock; the remaining nine cases were reported upon. In the first case, the animal lingered on about two weeks; suffered considerably, coughed, was affected with a nasal discharge, unable to walk, and finally died.

In the second case, the animal died the third day after the experiment. In the third case, the animal died on the tenth day; in the fourth case, on the eighth day; in the fifth case, on the sixth day; in the sixth case, on the thirty-first day; in the seventh case, on the twelfth day; in the eighth case, on the twelfth day; and in the ninth case, on the thirty-sixth day. It will thus be apparent that, in spite of the "successful" operations, every one of the animals died within a month or so, and usually within a few days of the operation. The following are excerpts from the official descriptions of the behavior of the animals after the operations:

20 October.—Cat is put into another room and spends all day climbing on and jumping off the furniture.

31 October.—Cat a little depressed. The kidneys are very much enlarged and fixed to the lumbar wall.

1 November.—Second operation on the same cat is performed.

16 November.—Animal weak and emaciated. Very abundant purulent nasal discharge.

17 November.—Animal very emaciated, weak, but still able to jump from his cage, and walks about the room. Abundant nasal discharge. Refuses to eat.

18 November.—Animal very weak.

19 November.—Animal died.

First day after experiment six:

12 July.—Animal a little shocked, lies down in its cage.

13 July.—Animal lies down and refuses to eat. From time to time she gets up, turns round in the cage, and cries as through suffering abdominal pain.

30 July.—Animal is apparently in excellent health. Nevertheless, both kidneys are enlarged and increasing progressively in size they are completely fixed and adherent to the lumbar region, being no longer movable in the abdominal cavity, as normal kidneys are.

From 3 August to 10 August the animal was in excellent condition, eating and acting as a normal cat. On August 11 she began to vomit in a few hours became very ill. Died on 12 August.

In the third experiment, transfusion of blood was tried; so much blood being drawn from

VIVISECTION—VOCATIONAL STUDY

another cat that the creature died. This failed to save the cat operated upon, however, which died a few minutes after the "successful" operation.

In view of the great suffering which many of the animals underwent, if not during, at least after, the operations, the New York Society for the Prevention of Cruelty to Animals took up the case; and petitioned Governor Dix to use his influence in the Legislature to stop operations of the kind. As yet, no definite steps have been taken however, towards preventing operations such as the above.

It will be seen that none of the above experiments offered any results of practical utility; but it is true that more successful experiments have been conducted within the past year. The results of some of these have been encouraging. It is certain, however, as Prof. William James has said, that vivisectionists should be made responsible to some one for their experiments; which should be under moral supervision, to see that a minimum of experiments are conducted, for certain definite purposes, and for those reasons only. If the practice of vivisection were restricted in this manner, it might be largely justified, and a compromise might be arrived at between the vivisectionists and the anti-vivisectionists.

Vivisection, Human. The question of the efficacy of vivisection in animals is a much disputed one—see preceding article. It is one of those matters about which everyone feels free to express himself; but which, nevertheless, no one should form an opinion about until he has made himself thoroughly familiar with the facts and arguments on both sides of the controversy.

Still more recent, and far more debatable, is the question of human vivisection or experimentation which has lately been mooted. Doubtless experiments of this character have been tried in secret many times, in many countries; but the open and avowed experimentation of this character is a new departure and one well worthy of serious consideration. While experiments have been tried on animals, doctors and bacteriologists have been compelled to seek their information regarding human beings by means of post-mortem examinations; or by an examination of the ravages which disease had worked, rather than by direct experiment. If a certain area in the brain is to be experimented upon, it can be removed from a dog or a rabbit, and the results noted; but in human beings, when similar effects are to be studied, physicians have had to wait until the individual developed a diseased area in his brain, corresponding to that removed in the dog or rabbit; and then the effects of the damage could be noted in the mental and physical health of the subject studied.

But now it has been proposed that experiments of a somewhat similar character be tried directly upon human beings. Not exactly of a surgical character, it is true; but more directly in the line of bacteriological investigation. Years ago, a number of volunteers permitted inoculation of themselves with the germs of yellow fever—for the sake of humanity—so that its possibly transmissible character might be studied. Now, Drs. W. Coover and A. L. Boar, of Indiana, have requested Governor Marshall to consent to an experiment of this

character that a life convict be inoculated with bovine tuberculosis, in order to settle beyond controversy whether or not it is transmissible from the animal to man. Doctor Coover is greatly interested in trying the experiment, and points out that the chances are that the convict will recover,—even should he contract the disease—in which case he is to be given his freedom. But he may not contract it. Governor Marshall is interested in trying the experiment, but is uncertain whether or not he has the legal right to pardon a state prisoner on such grounds. The matter is still open and unsettled. A large section of the public is naturally opposed to such an experiment; and, it has been pointed out, rightly enough, that the experiment even if tried might prove nothing, after all. Some individuals seem to be naturally immune to this disease; and if the experiment were tried, and the man failed to contract the disease, it would not prove conclusively that bovine tuberculosis could not be transmitted; it might require a dozen or more experiments to settle the question definitely. That being so, it is doubtful if the planned experiments will be conclusive, even if tried. The question raised is one of great interest, however, both ethically, and from the medical point of view; and its solution can only be left in the hands of time—like so many similar problems.

Vocational Study. The movement for vocational education, which has become national in extent, aims at two objects in the industrial province, one rural, pertaining to agricultural pursuits, the other urban, pertaining to the industrial demands of commercial and manufacturing centres. Of the many bills that have been introduced into Congress, embodying these purposes, two have become representative, the Davis Bill in the House and the Dolliver Bill in the Senate. Beginning July 1914, the vocational education Senate bill provides a main appropriation annually of \$10,000,000 as a cooperative fund toward placing agriculture, the trades and industries, and home economies in the secondary or high schools of the entire country; a further sum of \$1,500,000 for extension departments in the college of agriculture and mechanic arts; an appropriation of \$1,000,000 for the preparation of vocational teachers by State normal schools; and \$70,000 for the administration of these funds. Instruction is to be given in trades and industries, home economics will be taught in 300 to 400 high schools. Instruction in agriculture and home economics will be given in 300 to 400 agricultural secondary schools, one in each district of not less than five nor more than 18 counties. A branch of the State experiment station will be organized at each agricultural secondary school. Separate schools for colored people may be established as each State decides, fair division of the money being made to both races. Beginning with the fiscal year 1910-11, each State and Territory will, according to the bill, receive \$10,000 to aid its college of agriculture and mechanic arts in maintaining an extension department. This fund will be increased annually until it amounts to \$1,500,000 for the whole country, averaging about \$30,000 a State, the annual increase to be apportioned among the States and Territories, according to the agricultural population. No other one

VOCATIONAL TRAINING—WALDENSIAN CHURCH

agency has contributed so much to the rapid rise, industrially, of Germany as have its technical schools in reach of the productive classes. Japan studied the educational systems of all countries, and, having followed those which have inaugurated vocational education, is rapidly introducing a new industrial era. The new bill placed in concrete and practicable form the demands of a quarter of a century that a change in our educational system is necessary, and is based on the popular contention that education has drifted into lines too remote from the work the pupils are to do in life. It broadens out the curriculum by adding vocational studies to a course made up of traditional literary subjects. It is hoped to make for true Americanism, in that it will lead to more individualism in cooperation, as the mean between the extremes of service in corporations on the one hand and extreme socialism on the other.

Vocational Training. See VOCATIONAL CONFERENCES.

Volunteers of America. An evangelical Christian and philanthropic organization founded by Commander and Mrs. Ballington Booth, 9 March 1896, after separation from the Salvation Army. Latest reports state that it is established, by representative branches, in all the important large cities throughout the United States. Homes and institutions are maintained in different parts of the country to the number of 35, open for the accommodation of the needy. Volunteer Women's Homes in 1909 permanently aided 6,306 women, providing 4,477 beds. Visitations were made and aid afforded to 33,338 families by the Volunteer Commission workers among the poor and lowly of the large centres of population. Lodgings to the number of 435,908 were given, 350,719 free meals dispensed, and 1,48,112 meals provided for persons who paid for them either in money or work. At the Volunteers' Hospital on Gold street, New York City, a total of 47,697 medical and surgical cases were treated during the year. Patients admitted to the wards were 7,884, and the ambulance calls were 1,113. In about 20 State prisons the Volunteer Prisoner's League has a roll of over 50,000 members. Hope Halls are maintained to aid discharged men who have thereby been enabled to begin a new career of reformation and honest citizenship. The Fresh Air work provided a summer outing for 32,063 children and women during 1909.

Von Steuben Statue. The American nation paid a striking tribute to the memory of Baron von Steuben, the much revered Revolutionary hero, when, in the presence of President Taft, the army, navy, and diplomatic corps, and civic hosts, on 7 Dec. 1910, a splendid bronze statue to his memory was unveiled at Franklin Park, Washington, D. C. This

square now contains statues of Lafayette, Kosciusko, and Rochambeau, as well as of Baron von Steuben. Together they constitute a fitting token of the appreciation of the American people for the great services these foreign warriors performed for the country during its struggle for independence. The von Steuben statue was unveiled by the hand of Miss Helen Taft, the President's daughter. A multitude of representative German-Americans were in attendance to do honor to the occasion, delegations coming from as far West as Colorado Springs. The most striking feature of the ceremonies was the huge parade, in which 10,000 men were in line, under command of Major-Gen. William H. Carter, U. S. A. A special musical event was furnished by a chorus of 10,000 singers representing the United Singers' Societies, who rendered patriotic hymns during the exercises at the monument. Many stirring speeches were delivered, all of which touched on some phase of the life of Baron von Steuben and extolled his bravery as a soldier and his worth as a man. The principal speakers were President Taft, the German Ambassador, Count von Bernstorff, Representative Barthold, and President C. J. Hexamer, of the National German-American Alliance.

Voter's Assistant Law. This law is the outcome of the Australian ballot. The Delaware statute, Chapter 63, Volume 22, of the laws of Delaware, is a good example. It was first adopted after the Australian ballot. There was a clause providing for an officer who was known as "a voter's assistant" whose duty it was, first, to mark the ballot of any one who was physically incapacitated from so doing, and second, to mark the ballot of any one who requested him to do so on the plea that he, the voter, was ignorant of the proper method of expressing his choice of the candidates, whose names appeared upon the ballot. A learned critic of the law charges that the purchase of votes was in this manner greatly expedited by reason of the fact that if the voter's assistant was a venal person, he could make sure that the voter who sold his vote (and this of course was arranged beforehand) lived up to his bargain. So much sentiment was aroused that the Legislature finally repealed all the law, except that portion which allowed the election officers to mark the ballot for a person who was physically incapacitated from so doing. Many of the election laws throughout the country have this provision. But in 1901, the Delaware Legislature again created the office of Voter's Assistant, clothing that official with power to mark the ballots for all voters. Two years later, the Legislature sought to repeal this measure, but the Governor vetoed the bill. In 1910, the Democratic platforms of Delaware, Pennsylvania and Kansas demanded the repeal of the Voter's Assistant Law.

WALDENSIAN Church. The first Waldensian Church in New York was founded during the year 1910 in the parish house of the Church of the Holy Communion, 6th avenue and 20th street. The minister in charge is the Rev. Professor Griglio, who came to the United States under sanction of the Waldensian Church of Italy and who is

also an instructor in the Bible Teachers' Training School of New York City. The Waldensians maintain what is more of a Presbyterian than an Episcopal service and form of government. There are estimated to be about 200 Waldensians in New York City, all of whom are the traditional Italian Protestants. The new church aims for the present to gather

together its own Italian members resident in New York City into one operative unit. Not until that has been done will steps be taken toward the erection of a regular church edifice of their own or toward any more expansive work.

Wales. See GREAT BRITAIN.

Walker, William David, first missionary P. E. bishop of North Dakota, third bishop of Western New York, and 133d in succession in the American episcopate: b. New York city 29 June 1839. He was graduated from Columbia University A.B. 1859, A.M. 1863, and from the General Theological Seminary, New York City, in 1862. He was ordered deacon in 1862, advanced to the priesthood in 1863 and served as vicar at Calvary chapel, New York City, 1862-83. On 20 Dec. 1883 he was consecrated first bishop of the newly established missionary diocese of North Dakota, Bishops Clark, Coxé and Clarkson being the consecrators, assisted by Bishops Littlejohn, B. H. Paddock, John A. Paddock, and Potter. In Jan. 1897 he was translated to the diocese of Western New York, as successor to the Rt. Rev. Arthur Cleveland Coxé, deceased. Bishop Walker was conferred with the honorary degrees of D.D. by Racine College, 1884, and Oxford University, Eng., 1894; S.T.D. by Columbia University in 1884; LL.D. by Griswold College in 1886 and Trinity College, Dublin, 1894, and D.C.L. by Kings College, Nova Scotia, in 1892. He was also appointed a select preacher of the University of Cambridge, England, and President Cleveland appointed him a member of the board of Indian Commissioners in 1887.

Wallace Statue. A statue of Gen. Lew Wallace, famous as the author of 'Ben Hur' and 'The Prince of India,' was unveiled, on 9 Jan. 1910, in Statuary Hall at the capitol, Washington, D. C. It stands beside Oliver P. Morton, the war governor of Indiana. The inscription on the Wallace statue reads 'Lew Wallace, Soldier, Author, Diplomat.' The statue was unveiled by Lew Wallace, Jr., grandson of the man honored. In connection with the unveiling exercises the Rev. George Dudley delivered the invocation, and James Whitcomb Riley read an original poem. William Allen Wood presented the statue on behalf of the commission and the acceptance speech was delivered by Governor Marshall, of Indiana, on behalf of the State. Addresses were also made by Senator Beveridge and Klazin Bey, the Turkish Ambassador. A picturesque part in the ceremonies was borne by members of a theatrical company, which was appearing at the time in a local Washington theatre, in the dramatic version of General Wallace's masterpiece 'Ben Hur.' In the evening, a meeting of the Indiana Society was held in memory of the fellow-statesman who had been honored, while the Eleventh Indiana Volunteers, General Wallace's own regiment, also gathered together in commemoration of the dead soldier-author.

Walter, Eugene, American playwright, b. Cleveland Ohio, 27 Nov. 1874. He attended the public schools and engaged in journalism as a reporter on the Cleveland *Plain Dealer*. He subsequently reported for the Cleveland *Press*, Detroit *News*, New York *Sun*, New

York *Globe*, Cincinnati *Post* and Seattle *Star*. He abandoned journalism and interested himself in amusement enterprises as business manager. At the outbreak of the Spanish-American War he joined the First Volunteer Cavalry and served from April to Oct. 1898. He is the author of 'Sergeant James' (1901); 'The Flag Station' (1905); 'Paid in Full' (1907); 'The Real Issue' (1908); 'The Wolf' (1908); 'The Easiest Way' (1908); 'Boots and Saddles' (1910); 'The Guerrillas' (1910); 'For Rent' (1910); 'Just A Wife' (1910); 'The Assassin' (1910); 'Nela' (1910).

War Aeroplanes. See AEROPLANES IN WAR.

War, Customs of. By the customs of war is meant the code of laws and usages, for the most part unwritten, which govern the conduct of belligerent powers toward each other. Little more than a century ago it was considered perfectly proper for a general to urge on his troops by the promise that they might plunder and sack a city for one day, if they were successful in capturing it. At present this phase of warfare, however, is strictly taboo between civilized powers. Two hundred years ago, too, it was customary for an entirely honorable soldier to call upon a castle or fortress to surrender, with the warning that, as the place was considered untenable, no quarter would be given if an attack were forced. In making the ethics of modern warfare more in accord with civilized understanding, the Hague Conference (qv) has been one of the most powerful forces. The Hague Conference, for instance, recognizes the right of a civilian of an invaded district to fight in its defense, even if he be not uniformed, if the district in question is not at the time thoroughly subdued by the invader. The use and abuse of the white flag of truce is another thing to which the Hague tribunal has given much attention. There has been probably no war in recent years in which each side has not charged the other with misuse of this flag. Sometimes the origin of such charges is clearly that, though some of the troops feel it best to cease fighting and surrender, others of the same party are anxious to continue hostilities until killed. It is not generally known that, under certain conditions, custom permits troops to fire on the bearer of a white flag. The display of a white flag indicates a desire for communication. If the opposite side is willing to communicate, they stop firing, cease their advance, and signal the bearer of the white flag to proceed. But they are equally free to refuse, in which case they signal accordingly and continue advancing and firing. If the bearer of the white flag still persists in coming on, it is in no way a violation of the customs of war to shoot him. The reason for this is that, if the mere display of a white flag could compel a cessation of fighting, it might be employed at a critical moment as a ruse, to delay temporarily the advance of the attack on an important point. However, the right of refusing the white flag to come forward is one which is very rarely exercised.

One of the most satisfactory developments of the customs of war is the legislation as to the Red Cross (qv.) embodied in the Geneva Convention. Its effect is to neutralize and give as much security as possible to all that is connected with the care of the sick and wounded. This change affects more than the actual bat-

tle-field. Only as recently as the Civil War in the United States the Federals treated quinine as contraband, when it was known that the Confederate hospitals had run out of that medicine, whereas now cases marked with the red cross are commonly passed through the outposts. The Red Cross flag is to-day the most honored standard displayed on the battle-field, which speaks eloquently for the general advance of civilization. In this connection, few people are aware that the Red Cross flag is the flag of Switzerland with the colors reversed. The Swiss flag is a red flag with a white cross, while the other consists of a white background with the cross in red.

This effort to humanize war as far as possible is everywhere discernible. The tendency is now to avoid useless killing and mere destruction for its own sake, and, contrary to former custom, quarter is freely given. Men who have ceased to resist are, of course, sometimes killed when blood is hot, as when a position is stormed with bayonet or in the first rush of victorious cavalry, but there is no longer any killing in cold blood, nor slaughtering of non-combatants, though the latter, when within range of action, must necessarily take their own chances. Plunder and outrage are also sternly repressed, and the wounded are cared for, no matter to which side they may belong. The progress of centuries has made the object of war not to kill as many of the enemy as possible, but rather to "put them out of action," make prisoners of as many as possible, and disperse and cut off from supplies the remainder. No longer is promiscuous shooting between the outposts of contending armies in vogue; in fact, the outposts are nowadays frequently very friendly, exchanging comments on the weather and the state of the conflict, buying tobacco and borrowing matches from one another, and retiring, when the signal for an advance is sounded, without the exchange of a shot.

International conventions have also done much in shaping the customs of war with regard to bullets, in such a way as to forbid useless maiming and the infliction of avoidable suffering. On this principle there is a tacit understanding between civilized powers that soft-nosed, collapsible bullets which "set up" or "mushroom" shall never be used. Explosive bullets are also forbidden now, so that a lower limit has to be set to the size of projectiles that carry a bursting charge. No shell must weigh less than half a kilogramme—which is, roughly, one pound. This makes the little one-inch steel shell for the "pom-pom" fired in sets of ten and bursting like a string of fire crackers, the smallest shell used. In the South African war these inflicted few casualties, but none the less got strangely on the men's nerves. Soldiers all declare that they would much rather face rifle and heavy artillery fire than these pestiferous little projectiles.

Despite the constant efforts to improve and humanize warfare, there is one respect in which the present day brand is notably less chivalrous than in the Middle Ages. Then, and even up to a comparatively late date, there was a general disposition to make of war a tournament on a huge scale. The idea was ever uppermost that armies should be matched on equal terms on a "fair field." The strategy upon which

modern warfare so largely depends has entirely changed this, so that to-day the best general is he who takes his foe at the greatest disadvantage. Spies are still hanged or shot when detected, not because espionage is a crime in itself, but so as to make the spy's business more difficult and hence deter people from taking it up. The essence of espionage is disguise, since to-day no man is deemed a spy unless he actually disguises himself. Connected with the custom as to spies, are the written or unwritten laws that forbid the people of the country from taking an active part in the defense unless they have some plain badge to indicate that they are combatants. The whole legislation in regard to the patriotic action of civilians is rather more confused than any of the other ethics of present-day warfare. The German military law orders that, in case of invasion, the *levy en masse*, or "Land-sturm," is to be called out, and the armed inhabitants who thus come into action need not necessarily wear uniforms. The Prussians, on the other hand, used to shoot captured *franc tireurs* in France, on the ground that they were not regular combatants and were without recognized uniform or commissioned officers. It is generally recognized now, however, that the people in a town may fight in its defense without uniforms, on the ground that in a siege all the people within the fortifications are presumably enemies of the besieger.

Ward, John Quincy Adams, American sculptor: b. Urbana, Ohio, 29 June 1830; d. New York City, 1 May 1910. He attended the public schools and private tutors, and studied art under Henry K. Brown, the sculptor, of New York City, assisting him on the equestrian statue of Washington, 1850-57. In the latter year Mr. Ward opened a studio of his own in Washington, D. C., and engaged in modelling busts of prominent men, including those of John P. Hale, Alexander H. Stephens, Joshua R. Giddings, and Hannibal Hamlin, 1857-58. He later went west and made a study of the American Indian for his statue 'Indian Hunter,' which he completed in 1864 and which was placed in Central Park, New York. He opened a studio in New York; was an associate of the National Academy of Design in 1862 and an academician in 1863. Chosen vice-president of the National Academy of Design, 1860-71; was elected president in 1872; was president of the National Sculpture Society, 1866-1910; vice-president of the Fine Arts Federation, and of the Century Association; a trustee of the Metropolitan Museum of Art; and was actively associated with various other art organizations. Among his most important statues are those of William E. Dodge (1887); Horace Greeley, (1890); Roscoe Conkling; The Freedman (1861); Seventh Regiment Soldier (1868); The Pilgrim (1884); and Shakespeare (1871), all in New York; also the good Samaritan, Boston, Mass., (1864); Com. M. C. Perry, Newport, R. I. (1866); Gen. John F. Reynolds, Gettysburg, Pa. (1871); William Gilmore Semmes, Charleston, S. C. (1873); Gen. Israel Putnam, Hartford, Conn. (1874); George Washington, Newburyport, Mass. (bronze 1876); Gen. George H. Thomas, Washington, D. C. (equestrian, 1878); Gen. Daniel Morgan, Spartansburg, S. C. (1880); the James A. Gar-

WASHINGTON

field monument, Washington, D. C. (1887); Henry Ward Beecher, Brooklyn, N. Y. (1891); General Sheridan, Washington, D. C.; the colossal figure of 'Poetry' in the Congressional Library, Washington (1896); a bronze statue of H. B. Hyde for the Equitable Life Assurance Society (1900); equestrian statue of General Hancock; a group of colossal marble figures for the pediment of the New York Stock Exchange, Jefferson accepting the Instrument of Transfer of the Louisiana Territory, an heroic statue for the World's Fair at St. Louis (1904); and crowning group of 'Victory' on the Naval Arch, for the Admiral Dewey reception in New York.

Washington. A State of the Pacific division of the United States, having a population of 1,141,990, a gain of 120.4 per cent over 1900. The population per square mile is 17.1. The area is 69,127 square miles. The capital is Olympia.

Agriculture.—Various irrigation projects of the United States Reclamation Service are responsible for much of the agricultural development of the State. It has been extensively pursued in the arid regions east of the Cascade Mountains. The irrigated area as estimated by the United States Department of Agriculture was 178,000 acres and confined mainly to the Natchez and Yakima valleys. Under the Federal Reclamation Act, the irrigation and sale of lands is provided for, the proceeds being devoted for further irrigation. The acreage, production and value of important farm crops in 1910 were as follows: Corn, 448,000 bushels, acreage 16,000, value \$336,000; winter wheat, 13,858,000 bushels, acreage, 676,000, value, \$10,809,000; spring wheat, 11,745,000 bushels, acreage, 810,000, value, \$9,161,000; oats, 8,817,000 bushels, acreage, 206,000, value, \$4,232,000; barley, 5,394,000 bushels, acreage, 186,000, value, \$3,075,000; rye, 123,000 bushels, acreage, 6,000, value, \$109,000; potatoes, 5,109,000 bushels, acreage, 39,000, value, \$3,730,000; hay, 815,000 tons, acreage, 388,000, value, \$12,796,000. The farm animals of the State on 1 Jan. 1910 were, horses, 330,000, value, \$35,640,000; mules, 5,000, value, \$605,000, milch cows, 205,000, value, \$8,569,000; other cattle, 358,000, value, \$7,124,000; sheep, 783,000, value, \$3,054,000, sheep of shearing age, 450,000; average weight of fleece 95 pounds; per cent of shrinkage, 69; wool washed and unwashed, 4,275,000 pounds; wool scoured, 1,325,250 pounds; swine, 813,000, value \$1,720,000.

Mining and Manufacturing.—Washington is the only one of the Pacific coast States in which coal mining is an industry of any importance. There has been a decided increase in the production of coal at the commercial mines. The railroad mines, or those operated by railroads or subsidiary companies, for the exclusive use of the railroads themselves, showed about the same production in 1910 as in 1909. The production in some mines exclusive of these show an increase as high as 50 per cent. The total production was between 4,500,000 and 5,000,000 tons. An eight-hour day prevails in all the important mines of the State. The value of the mineral products was \$11,610,224. Other minerals besides those mentioned are lime, coke, gold, sand and gravel, copper and silver. Mineral waters, platinum,

tungsten and zinc are also to be found in the State. The gold production was 18,282 fine ounces of the value of \$377,900, and the silver 73,500 fine ounces of the value of \$38,200. The capital employed in the manufactures amounts to \$96,952,621, the wage earners number 45,199; the wages paid, \$30,087,287; and the value of the products is \$128,821,667. The principal industry is lumber and timber, with a capital of \$40,953,816; wage earners, 28,023, value of output, \$49,572,512; cost of material, \$10,325,594. Flour and grist are next in importance; capital employed, \$6,490,492, wage earners, 613; cost of material, \$12,771,390; value of output, \$14,663,612. Other large industries of the State are slaughtering and packing, planing mills, foundry and machine work, fish canning and preserving, brewing, dairy products and railway car works.

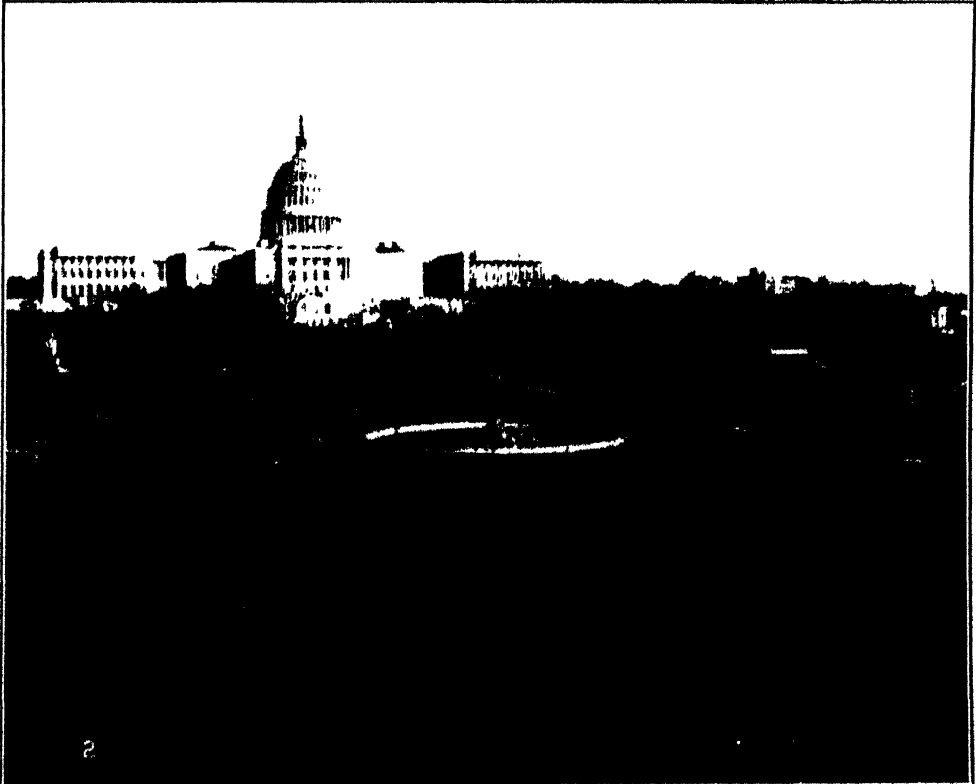
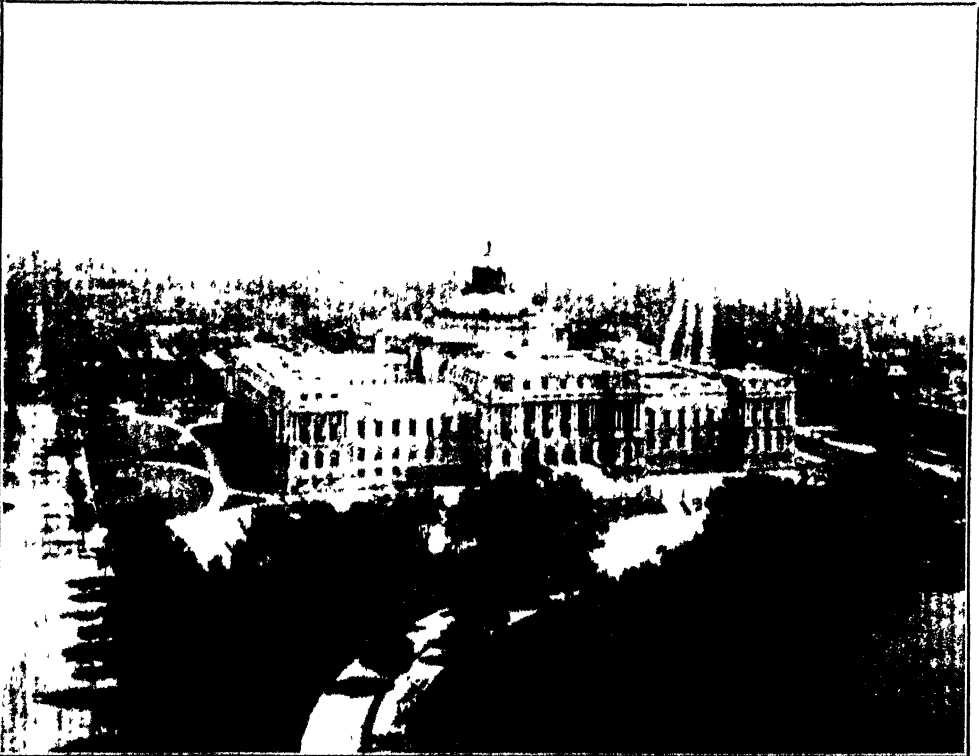
Fisheries.—The value of the annual capture was \$1,161,669, and the capital \$309,235. The value of the products was \$3,513,238. Number of persons employed in the industry, 4,954; number of vessels, 190; boats, 2,798. Salmon is the most important product. Halibut and oysters come next. The catch and value of the various fish were as follows: salmon, 57,508,800 pounds, value, \$1,318,660; halibut, 30,071,500 pounds, value \$1,235,760; oysters, 14,807,800 bushels, value, \$334,560; clams, \$34,210; hard crabs, \$50,850; and shrimp \$21,840.

Government.—The Governor of the State is M. E. Hay, Republican, term four years, salary, \$6,000 a year. Some other State officers, all Republicans, are Secretary of State, I. M. Howle; Treasurer, John D. Lewis, Auditor, C. W. Clausen, Attorney-General, W. P. Bell. The composition of the State Legislature is as follows: Senate—Republicans, 37; Democrats, 5. House—Republicans, 84; Democrats, 12. The present member of the United States Senate is Wesley L. Jones, Republican; the other Senator is to be elected. The members of the House of Representatives are William E. Humphrey, Stanton Warburton, and William LaFollette, all Republicans.

Finance.—State revenue and expenditure for the biennial term ending Sept. 30, 1910 were: Revenue, \$13,381,637; expenditures \$12,044,263. The bonded debt is \$1,006,024. The total assessed valuation of the real and personal property is \$789,912,070, and the tax rate \$31 per 1,000. The debts of the cities, counties and minor civil divisions, is \$28,285,343. The cost of the government is \$4,281,715. There are 72 National banks, with 43,673 depositors, and deposits of \$10,828,747; 152 State banks, with 55,153 depositors, and deposits of \$15,719,012.23; 14 loan and trust companies, with 24,287 depositors, and deposits of \$4,612,171.73; and 32,421 depositors in saving banks, having deposits of \$9,406,385.42.

Religion and Education.—The religious denominations of the State are as follows: Roman Catholics, 33,329 male and 33,203 female; Methodists, 11,729 male and 18,146 female; Presbyterians, 6,377 male and 9,049 female; Lutherans, 5,768 male and 6,206 female; Congregationalists, 3,511 male and 4,464 female; Baptists 4,890 male and 7,548 female. The number of pupils enrolled in the public schools is 215,688, the average daily attendance 156,064, and the total actual days attendance in all grades for the fiscal year 26,871,402. The num-

WASHINGTON, D. C.



1. The Library of Congress

2 The Capitol, West Front.

WASHINGTON, D. C.



1. The Main Entrance of the White House
2. Grand Corridor of the White House.

WASHINGTON—WATER POWER

ber of school-rooms or departments maintained during the year was 6,469. The teachers employed were 7,170, of whom 5,736 were females and 1,434 males. The average salary paid to the male teacher per month is \$79.56; to the female, \$62.95. There was expended during the year the sum of \$11,017,983.64.

Charities and Corrections.—There are hospitals for the insane, one with 879 inmates, another with 470, a soldiers' home with 206, a school for the deaf and blind with 142, an institution for the feebleminded with 82, a school for defective youth with 287. In addition, 24 hospitals, 8 orphan asylums, and 8 homes are maintained by private individuals and religious bodies. The poor are under the jurisdiction of county commissioners, who may provide for them either by contract or by their own agents. A residence of six months is required for a pauper to obtain relief. The number of prisoners admitted to the State prison was 382 male, and 156 female. The deaths were 99 male and 37 female. There was expended for the State penitentiary \$228,506.53, the State Reform School, \$71,815.13; the School for the Deaf and Blind, \$79,705.74; the Hospital for the Insane of Eastern Washington, \$201,545.81; and the Western Washington Hospital, \$332,961.80.

Legislation.—The Legislature meets in biennial sessions which are limited to 60 days. There was a special session in 1910. At the 1909 regular session acts were passed requiring Superior and Supreme Court Judges to wear black silk gowns on the bench; requiring judicial nominations to be made at party conventions; directing trial judges to reduce their charges to writing and read them to the jury before argument of counsel; placing telegraph and telephone companies under the jurisdiction of the railroad commission; enacting a local option law; giving cities and towns the power to condemn, purchase and operate street railways; and making the selling, giving away or having possession of cigarettes a crime.

History, 1910.—There were severe forest fires during July of 1910, resulting in the wiping out of the town of Ryan on the Columbia river, 12 miles south of the Canadian border, and covering approximately the whole territory from Bossburg to Marcus and north to Ryan, which is 15 miles long by 7 wide. Thirty Japanese were driven from Darlington, a town in the extreme northern part of Snohomish County, 50 miles from the coast, by 100 white men. The Japs were in the employ of a lumber company. More than 10,000 gold seekers passed through Tacoma during June on their way to the mouth of Otter Creek on the Iditarod River, which is a scene of the latest gold discovery of Alaska. Governor Hay declined the request of the women of Sunnyside, made the latter part of December, that he recommend a bill to the Legislature exempting them from jury duties.

Washington, D. C. According to the census of 1910, Washington has a population of 331,069, a gain of 18.8 per cent since 1900. It is the 16th city in size in the Union. Washington has an area of 69 square miles. It has 465 miles of paved streets. The annual death rate is 18.12 and the birth rate 20.48. The assessed value of the real estate is \$285,152,771.

and the personal property, \$39,000,000. The tax rate is \$15 per \$1,000. Washington has a net public debt of \$12,766,379. The annual cost of the city government is \$12,815,795; the per capita, \$38.71. Of this sum, \$2,148,826 is spent for the schools where the pupils number 56,136, and the principals and teachers, 1,684; \$520,630 for the fire department consisting of 459 men; and \$975,553 for the police, whose membership is 732. Their annual arrests average 32,105. Washington owns its water works. They cost \$15,971,000. There are 500 miles of mains and the average daily consumption is 59,260,000 gallons. The daily capacity of the water works is 80,500,000 gallons. It costs the city \$125,000 for electric light, and \$280,000 for gas. There are 550 miles of sewers. The street cleaning department entails an annual expenditure of \$250,000. There is an additional annual cost of \$190,945 for the removal of garbage and ashes.

Much headway has been made with the plans for the beautification of Washington. It is the plan of Congress to purchase all the land on the south side of Pennsylvania avenue between the Capitol and the White House and add it to the mall, the entire section to be reserved as a site for public buildings. Five squares of ground have already been purchased. They are to be the sites for the buildings of the Department of Justice, the State Department and the Department of Commerce and Labor. The aggregate cost of the three new buildings will be \$8,000,000, and plans have already been submitted by leading architects throughout the United States. The park and building system is to be extended along the lines laid down by the Park Commission, of which Daniel H. Burnham, Frederick Law Olmstead, and McKim, Meade & White were the original promoters.

Washington Memorial. Two million dollars as the share to be raised by the George Washington Memorial Association and \$230,000 to be raised by Washingtonians, is the basis upon which Granville Hunt, chairman of the convention's committee of the Washington Chamber of Commerce, is working to obtain a memorial hall for the national capital. The proposed building plans include separate rooms for every State in the Union.

Water Power. The three great sources of fuel in this country have been coal, oil, and the gravitational effect of water. Of the three, water power has received the greatest amount of development in recent years, and the present decade will unquestionably be characterized by a marked increase in this respect and the addition of many thousand miles of transmission lines for electricity, making it possible to carry on manufactures by electricity many miles from the power plant. This, in fact, has already become the chief source of power in the South and on the Pacific Coast, and has only been retarded in California by the increasing production of cheap oil.

Other sources of fuel being subject to exhaustion, water power has become recognized as the power of the future, and on that account there has been, within recent years, great financial activity in securing power sites and developing power plants at the most important points. Many of the best of these were se-

WATER PURIFICATION—WATERWAYS

cured on the public domain before it became apparent that these power sites would in time become immensely valuable, but, since it will be practically impossible to create an absolute monopoly in this respect, no great fear is felt. During 1910, not less than \$100,000,000 was invested in plants for the development of water power. The essential factors in the development of water power were expressed by Secretary of the Interior Ballinger, as (1) a saving of the natural fuels, coal, oil, gas and forests, (2) a lessened expense in the irrigation of agricultural lands and in securing power for mine development, (3) the restraint of flood water and the augmentation of waters for navigation. He recommended that the lands where power can be developed be disposed of on leases with a reasonable maximum, the title to remain in the Government, and that the contracts be made to read so that the Government will share in the profits; also that the books of the power companies be subject to Government inspection.

Great development of water power has taken place in the South. The increase in the textile industries has created a demand for power which has been supplied in this manner at a comparatively cheap rate. The wonderful development of the South has, then, been in part due to the development of water power. From the Potomac to the Gulf, water power plants have been developed, and all of the larger cities have electric plants operated by water power. The aggregate amount of horsepower is approximated at 500,000 in the South alone. Lines of 50 to 100 miles long carrying the power to industrial plants are common. This has enabled the building of plants in healthful surroundings and centering the factories according to population rather than power. In the five years preceding 1 Jan 1911, there was greater development of water power in the South than in all the preceding time. Altogether, on the streams flowing from the Appalachians into the Atlantic, it is possible to develop 2,000,000 horse-power, only a small proportion of which has as yet been touched. The lack of snow and ice in the South has made this form of development particularly easy. The same thing is true of the Pacific slope, where snowfall is unusual. It has been figured that water power can be produced in small units at from \$10 to \$15 cheaper than steam power, even where coal is obtainable at from \$3 to \$4 a ton. The Southern Power Company, on 1 Jan. 1911, was producing 130,000 horse-power at plants ranging from 3,000 to 30,000 horse-power. The North Georgia Electric Company has been incorporated with the purpose of developing 11 power sites.

Water Purification. See OZONIFICATION.

Waterways. The purpose of these canal projects is to secure an inland passage from New England to Florida and the Gulf of Mexico, and for the completion of the "Lakes to Gulf" project. Of the many plans formulated, the most ambitious are those of the Atlantic Deep Waterways Association, which crystallized into an active demand at the convention held at Providence, R. I., during Sept. 1910.

The present movement is believed to mark the beginning of a second era of canal building comparable to that which marked the early

portion of the last century. That had not yet reached its zenith when the building of the railroads, providing a quicker form of transportation, made a further increase in canals seem unfeasible and put an end to further development. The present demand arises from an entirely different situation, and is not expected to be lessened by the invention of other forms of transportation.

The question of freight rates, which cannot be materially lowered on the railroads, having seriously affected the manufacturers of New England, who are compelled to bring raw material great distances, and the frequent storms of the Atlantic permitting only the use of expensive ocean vessels, the manufacturers of the North and the producers of the South believe the problem can be solved by the digging of canals, capable of floating large, deep-water vessels, to connect the existing inland waterways from Maine to the Gulf of Mexico. The magnitude of the project, the expense of digging the canals and providing suitable ports, although greater than any public work hitherto contemplated, is believed to be more than matched by the saving in the cost of transportation. Complete figures are not as yet available, but it is thought that such a series of deep-water canals would cost several times the amount invested in the Panama Canal. And, as a national investment, the Atlantic Deep Waterways Association holds it would be a greater national asset.

Of the raw material imported into New England each year, coal alone costs \$100,000,000. It is carried North in sea-going barges and is necessarily brought through serious storms and almost continuous bad weather for the greater part of the year. This condition greatly increases the cost of transportation, raising the price of coal in New England far beyond what it would be if the transportation were easier.

It has been estimated that of the \$1,000,000,000 annually spent for coal not less than \$70,000,000 is charged to transportation. This would be cut to a large extent, possibly half, if the coal could be transported north over a safe, easy water course. Other raw commodities, it is estimated, cost a proportionally greater amount than if they were also to be brought by an inland route.

The most northerly project which came in for a large share of the consideration of the Providence Convention was a ship canal through Point Judith, at the southerly end of Rhode Island Sound, obviating the passage through the open sea at this stormy portion of the coast. The passage around Point Judith is short, but is extremely dangerous. No estimate has been given as to the probable cost of a canal at that point, connecting Long Island Sound with Narragansett Bay, but it is regarded as inconsequential beside the most important project of all, an inland ship canal through the marshes of eastern North Carolina, cutting off the passage around Cape Hatteras, known as the "graveyard of the Atlantic."

This portion of the canal project has come in for the most serious consideration, on account of the undoubted risk of navigating what is described by seamen as one of "the dirtiest pieces of water" found in any part of the world. The difference in insurance rates between vessels which are compelled to take the

WATERWAYS—WATER WORKS SYSTEMS

outer course and those capable of navigating the Norfolk-Beaufort or inner route shows the greater attendant risk on deep-water navigation, and, although the cost of a deep-water canal on the shoreward side of the Diamond shoals and Cape Hatteras would be commensurate with the greatest national undertakings, so large a traffic would make use of it that it is held the project would justify itself. Fifty million tons of commerce pass around Point Judith annually, and an even greater amount would make use of a deep-water canal obviating the passage about Cape Hatteras.

After several days of deliberation bearing on the feasibility of the Atlantic Deep Waterways, the convention at Providence epitomized its demands into the following brief statement:

"We demand the construction at an early date of the deep-water ways along the Atlantic coast as a measure imperatively required to prevent the strangulation of the transportation business of the millions of people affected by the seaboard commerce.

"Railroad transportation clearly cannot meet, in any length of time, the swift-growing requirements of American business, at the best, railroad expansion, no matter what time may be given, is necessarily limited, while the possibilities of expansion on waterways, properly constructed, are practically unlimited.

"It is clear to us that it must be greatly to the public advantage that the demands of the prospective certain growth of commerce shall be anticipated rather than they shall be disregarded until the choking of the channels of trade and the semi-paralysis of business shall make remedial measures compulsory, after heavy losses have been inflicted."

The value of the products of the sections under consideration, which would make use of the deep water-ways was estimated as follows: Manufactures, \$10,000,000,000; farm products \$3,000,000,000; products of mines, forests and fisheries, \$1,000,000,000; making a total production of \$14,000,000,000 per annum within these sections affected.

This enormous amount of merchandise is carried within the Maine to Texas area at the present time by three agencies; first, the railways, which, according to the estimates of the Interstate Commerce Commission, carry within the area in question, 600,000,000 tons of merchandise; second, the coastwise water lines which transport, according to the Census Bureau, about 65,000,000 tons a year; and, third, the navigable streams, flowing across the section, over 200 in number, with over 10,000 miles of navigable water. These rivers carry to the Gulf of Mexico and the Atlantic Coast 100,000,000 tons. Altogether, there is a tonnage of about 750,000,000, valued at \$750,000,000.

Safe and easy transportation of these products is believed to be of sufficient importance, in comparison with present methods, to justify the construction of the expensive canals. Within the past decade, according to the figures of the Life Saving Service, 5,667 vessels have been wrecked or sunk on the Atlantic Coast and in the Gulf of Mexico, with a total loss of 2,222 lives and the destruction of vessels and merchandise valued at \$490,000,000.

The Atlantic Deep Waterway is an undertaking of greater magnitude than the Lakes to Gulf project, but both will bring about simi-

lar results, if constructed. With the present unprecedented development of the South, the commerce is steadily increasing and, both in the Mississippi valley and in the Atlantic States, the need for cheaper transportation is becoming imperative. See CANALS.

Water Works Systems. During 1910, much attention was focussed upon the water works systems of the city of Mexico and Los Angeles. Both have started to obtain their water supply from distant sources, the same as the city of New York with its Catskill project. The new system for the city of Mexico was dedicated in September but will not be completed for nearly two years. The bulk of the work is now finished, and part of the new supply is available in certain portions of the city. The system consists of (1) the supply wells, which will yield a continuous flow of 2,000 liters of water per second; (2) a reinforced concrete conduit about 30 kilometers long in which the water is conveyed from the springs to the city; (3) four covered distributing reservoirs; (4) five pumping plants, four of which will be used for forcing the water into the conduit and the fifth for raising the water from the conduit to the reservoirs; and (5) a new system of distributing pipes in the city. The source of the supply is a huge basin of artesian water underlying the surface at the foot of the Ajusco Mountains. These waters bubble to the surface at four springs close to the shores at Lake Xochimilco, the flow of which has been increased by sinking wells in each of the springs. The volume of water available from this source is in excess of 2,500 liters per second, but only 2,000 are being utilized at present. It is estimated that this rate of supply will afford 100 gallons of water per capita for a population of 600,000. The level of the springs is the same as that of the city. This makes it necessary to lift the water to a height whence it may flow by gravity to the pumping station below the reservoir. The lifting head of the pump at the springs varies from 6 to 12 meters. The conduit is circular in form and ranges in diameter from between 4½ to 6 feet. It has capacity, according to Kutter's formula, for a grade of 0.0003. There are ventilating chimneys and control gates at uniform spacing of 333 meters, for its entire length. The latter are to be used in case of repairs to the conduit or to isolate any section from the remainder. Flexible joints have been devised for the conduit to give sections sufficient play at the points of juncture for the protection of the conduit in the case of seismic disturbances. There are two centrifugal pumps driven by electricity at each of the four pumping plants at the springs, and three centrifugal pumps, similarly operated, at the city end of the conduit, for forcing the water into the reservoir. Each of the four circular reservoirs is 100 meters in diameter, and can store 50,000 cubic meters of water. The combined capacity of the four is equal to 30 hours' supply. The roofs are formed of concrete girders and slabs, supported by reinforced concrete columns. A square reinforced concrete subway, about 6 feet wide, has been constructed from the gate chamber, through the city, for the main distributing pipes. There is space in it also for telephone and telegraph, and electric light and power wires. Forty-eight

WATER WORKS SYSTEMS—WAVE ENERGY

miles of 6-inch pipe are being used in the city. The weight of the pipe is 3,500 tons

The Los Angeles aqueduct has six storage reservoirs and 215 miles of conduits. The largest reservoir is on the main stream at Long Valley, about 50 miles above the point where the aqueduct diverts the river. Its elevation is 7,000 feet. The dam there is 160 feet high. It is possible to impound 340,000 acre-feet of water. The main canal is 50 miles below the Long Valley Reservoir. It has a capacity of 900 cubic feet of water per second, and a width of 65 feet on the bottom. It diverts the river and various tributaries as they are passed, discharging into the Haiwee Reservoir, 60 miles below the intake. This 900 cubic-foot canal will carry all ordinary summer flood waters caused by the melting of the snow. The capacity of the Haiwee reservoir is 64,000 acre-feet and it will regulate these flood waters to a uniform flow of 400 cubic feet per second, or 258,000,000 gallons daily. The aqueduct consists of 43 miles of tunnels, 98 miles of covered conduit, 41 miles of lined open conduit, 21 miles of unlined canal, 12 miles of steel siphon and 882 feet of concrete flume, a total of 215 miles. The Haiwee reservoir is 7 miles long. There are power conduits to be constructed in the San Francisquito canyon, 11 miles long. The terminus of the aqueduct system will be at the Fernando reservoir, about 14 miles north of Los Angeles. The water will then be delivered to the city in pipes. Large storage reservoirs are to be built in the San Fernando valley, in which such a portion of winter flow can be accumulated as is not required during the rainy season. The first 20 miles of the canal in the moist artesian lands of Owens Valley is being excavated by hydraulic dredges. For the next 40 miles to the Haiwee river, the canal is concrete lined but not covered. Below the Haiwee river to the suburbs of Los Angeles, the aqueduct will be completely lined and covered with concrete. The canyons are to be crossed with steel pressure pipes, 10 feet in diameter and with pressure heads varying from 200 to 900 feet. During the past two years, 38 miles of tunnel have been excavated. The cost of the work will be \$1,500,000 for lands and water rights, \$23,000,000 for hydraulic work, and \$3,500,000 for water power installation.

The question of obtaining an adequate supply of pure water for large American cities is being rapidly solved by the construction of long aqueducts. The most stupendous of these is the Catskill Aqueduct to furnish pure mountain water to New York City, but works of a more difficult nature are in the course of construction, or contemplated, for the Pacific Coast. Many cities of the South, have within the past few years, greatly improved their water supply, and the construction reservoirs and filters have assisted in producing good water in the Middle Western States; but the cities close to large mountain ranges are the most favored in this respect.

In 1908, San Francisco voted municipal bonds to pay for the construction of an aqueduct from the Hetchy-Hetchy valley in the Yosemite National Park to San Francisco, but opposition was raised against the scheme by those interested in the Spring Valley Water Company which supplies the city with water at present; and sufficient sentiment was roused

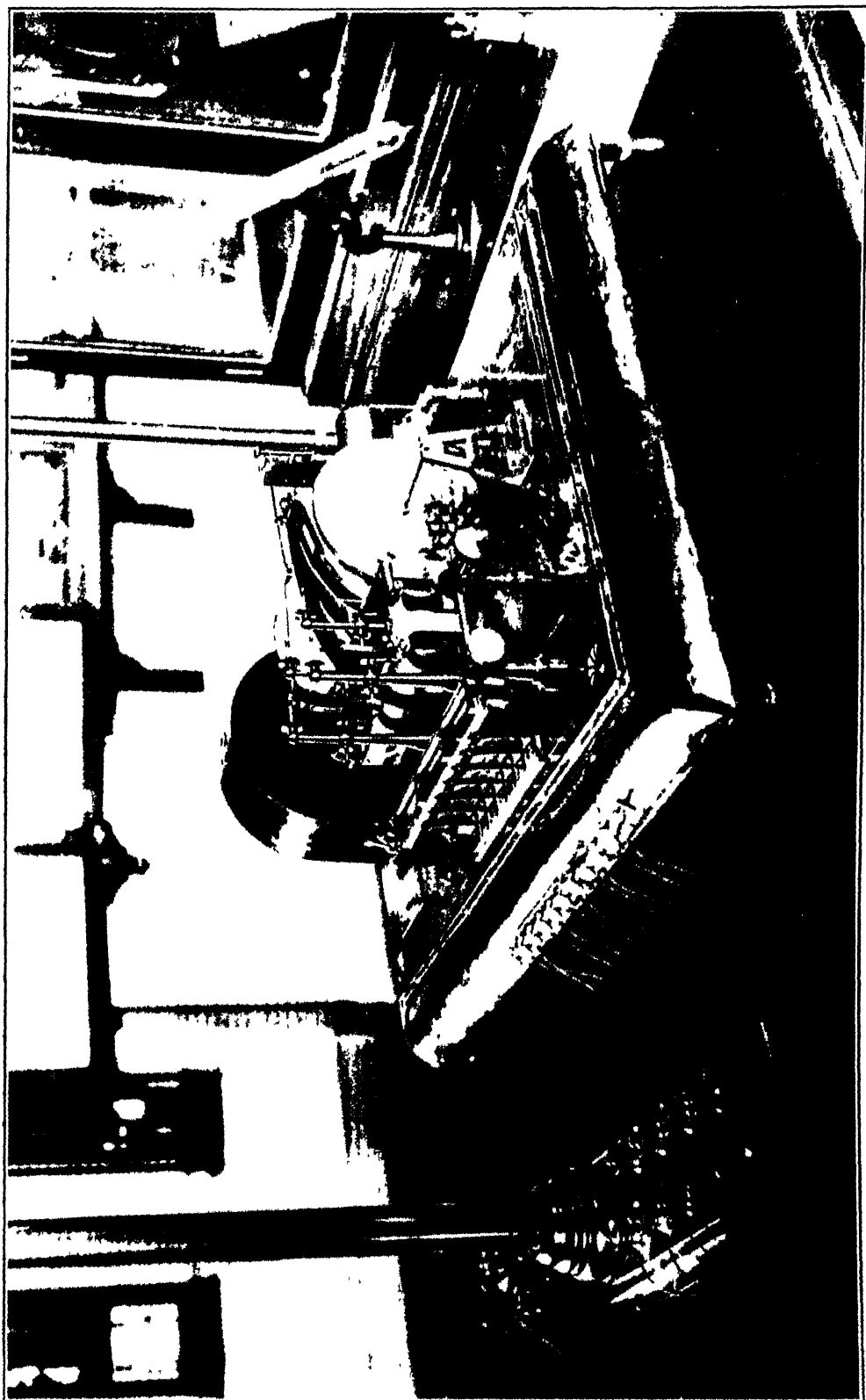
against it to make it possible to secure from the Secretary of the Interior an order asking the Supervisors of San Francisco to show cause why the Hetchy-Hetchy valley and reservoir site should not be eliminated from the order which was secured from Secretary Garfield. A continuation of this order was granted until June 1911, to enable the city to secure the necessary information to show why a supply could not be adequately furnished by water from Lake Eleanor basin, in the same system of water courses. The decision is to be left to a board of army engineers, and the outcome is not worrying San Francisco, which feels certain that it will be permitted whatever latitude is necessary. Unfortunately, in the meanwhile, the local water company is unable to supply the city with its needs and claims that it is not under the necessity of attempting to do so, since the city has taken steps to supply itself and make any expenditures of the old water company useless within a few years.

No such difficulty was encountered on the part of Los Angeles, which is bringing water from the headwaters of the Owens River in the Sierras, a distance of over 200 miles, a large part of the distance over the desert. The intake is in the Inyo National Forest, and the aqueduct passes through national forests a large portion of the way. The system consists of six storage reservoirs and 215 miles of conduit. The largest reservoir is at an altitude of 7,000 feet. The dam here is 100 feet high and 340,000 acre-feet of water are impounded, which is only 28,000 acre-feet less than the capacity of the Ashokan reservoir being constructed for New York City. The main canal has a capacity of 900 cubic feet per second and a width of 65 feet on the bottom, through which the river is diverted to the Haiwee reservoir 60 miles below, where a reservoir, with a capacity of 64,000 acre-feet, will regulate the flood waters into an even flow of 400 cubic feet per second, which is 258,000,000 gallons a day. From the Haiwee valley the aqueduct is being built along the eastern base of the Sierras, crossing the western arm of the Mojave desert and passing under the coast ranges in a tunnel 5.1 miles long. As the country is broken, it has been necessary to construct many tunnels and concrete flumes of great strength to handle the water. The total tunneling distance is 43 miles. Of these, 38 miles were built in 1909 and 1910. The people of Los Angeles voted \$1,500,000 for the purchase of lands and water right, \$23,000,000 for the hydraulic work and \$3,500,000 for water power installations. Not the least difficult part of the task was the supplying of water, lodgings and material for 4,000 men and thousands of horses and mules in the heart of a desert.

The other Pacific Coast cities, Portland, Tacoma, Seattle, etc., being nearer the mountains, have constructed pipe lines from the mountains. The Bull Run water in Portland, piped 50 miles, has been in use for more than 15 years. The Bull Run River is also in a forest reserve and is carefully protected from any pollution.

Wave Energy. It has been the object, for a number of years past, to utilize in some way the energy of the waves breaking on the shore—which has, so far, remained entirely wasted. Nevertheless, this is one of the most

WEATHER



powerful and unending energy generators in the world. Various attempts have been made in the past to devise machines which would accomplish this, at small expense, but until lately without success. During the past year, however, Agostino Ravelli, an Italian engineer, has succeeded, he says, in perfecting a machine which utilizes this energy, and is capable of generating 500 horse power much cheaper than any other apparatus that has ever been invented. The apparatus consists in an inclined plane on a two-wheeled support, which is run into the sea. By means of a mechanical device, the secret of which is known only to the inventor, the energy of the waves is transferred to a rotary wheel, to which may be attached pumps, hydraulic or otherwise, or dynamos, as desired. An attachment to the machine stores, against calm weather, part of the energy generated. It is hoped that the present machine, which is reported upon favorably by the Italian Government and is patented in 22 countries, will prove a great success, and will help to revolutionize the invention of machines of this character.

Weather, Control of. The long-continued effort to control the weather and cause rain or sunshine as needed, was discussed by Signor Ferranti, in a lecture before the Institute of Electrical Engineers in London, 12 Nov. 1910. By the use of electricity, the production of which he prophesied would be accomplished soon at one sixteenth the present cost, the clouds passing overhead could be forced to give up their moisture wherever required. He was speaking chiefly of Europe, where these electrical defenses could be placed on the sea-coast, causing a precipitation of rain on the sea before it reached the land. An attempt was made by Senator Piles, of Washington, to secure orders by the War Department to fire 141 guns in the coast defense forts on Puget Sound—hoping to bring rain that would quench forest fires raging during the autumn of 1910. The War Department asked for an opinion of Willis L. Moore, chief of the Weather Bureau, and he replied that it would not have the desired effect, as rain is produced only by a marked increase of the vapor contents of the air or by a decided lowering of the temperature.

Webb, William Walter, sixth P. E. bishop of Milwaukee and 231st in succession in the American episcopate. b. Germantown, Pa., 20 Nov. 1857. He entered the University of Pennsylvania in 1875, left during his sophomore year, and was graduated from Trinity College, Conn., A.B., 1882, A.M. 1885; studied theology at the Berkeley Divinity School, and was graduated from that institution B.D. 1885. He was ordered deacon in the same year, and was appointed assistant at Trinity Church, Middletown, Conn., serving for one year, when in 1886 he was ordained to the priesthood and was rector of the Church of the Evangelists, Philadelphia, 1886-89; and of St. Elizabeth, Philadelphia, 1889-92. He was professor of dogmatics at Nashotah Theological Seminary, Wisconsin, 1892-97; president of the seminary, 1897-1905; and in the latter year was elected bishop coadjutor of the diocese of Milwaukee. He was consecrated, 24 Feb. 1906, Bishops Nicholson, Grafton and White officiating. On the death of the Rt. Rev. Isaac Lee

Nicholson, 29 Oct. 1906, he succeeded to the episcopate as sixth bishop of Milwaukee. The honorary degree of D.D. was conferred on him by Nashotah Theological Seminary in 1897. Besides his presidency at Nashotah, he was president of the board of trustees of Racine College and of Kemper Hall. He is the author of 'Index to Electioylsis' (1882); 'Guide to Seminars' (1887), and 'Cure of Souls' (1892).

Webster Birthplace Association, The. On 26 Oct. 1910, the Webster Birthplace Association was formed at Franklin, N. H., with ex-Senator William E. Chandler, of Concord, N. H., and Chief Justice Frank M. Parsons, of the New Hampshire Supreme Court, at its head. The new society's object is to raise funds for the purchase of the house in which Daniel Webster was born in 1782, to collect all the available relics of Webster still existing, and, after putting them in the house, to maintain it as a sort of museum. The Webster birthplace is four miles from the centre of Franklin on the Salisbury Road, and of late years has been owned by a building and loan association which has been renting it to anyone who wished to hire. The house, which was built by Daniel Webster's father, is more than 150 years old.

Weights and Measures. Recent investigations by commissioners and supervisors of Weights and Measures, have disclosed many flagrantly corrupt practices and a growth of fraudulent "trade customs," which are being ordered out of existence by new laws.

Raids on retail dealers and hucksters have been made in many cities, and vicious methods have been discovered in almost every instance. Boxes with false bottoms and buckets concealing much smaller metal linings have been the most common forms of cheating discovered, but there have been less obvious devices, such as nails through the bottoms of measures into which peas are poured. The dealer turns the measure upside down and the customer appears to be getting an honest measure but loses a layer or two on the bottom. Other grosser methods are weights used on scales with a portion of the metal bored away and replaced with cork, over which a covering of paraffin has been spread.

Dents in measures have also accounted for small losses by customers; but the most ingenious device was found in the possession of a Brooklyn oil dealer who had a small can inside the larger one used for measuring. He filled the can, perhaps, half full and then, drawing the smaller can close to the opening filled it to overflowing. The customer, seeing the oil apparently up to the neck of the can, believed he was getting full measure, and the oil man, through long practice, was able to pour it out in such a manner as not to arouse the customer's suspicions.

More important, however, than the use of short weight scales and deceptive measures have been found to be trade customs and tricks of the retailers, which would not be so readily discovered as short weight scales.

The small, wooden boxes into which butter is placed before being weighed are accredited with having caused millions of dollars' loss to consumers, and the hand with which the butcher steadies a roast or leg of lamb on the scale

WEIGHTS AND MEASURES—WESTERN AUSTRALIA

may cost the customer as much as 20 to 25 cents without being noticeable. Another of the butcher's tricks, which is only to be remedied by the purchaser, is the custom of the butcher, after weighing a piece of meat, to trim off portions and throw them apparently on the floor. Investigation has shown that they do not in reality throw them away, but sell them a second time to make soup stock.

In the larger cities, the frauds have been more pronounced and the more crowded the districts the more brazen the attempts at cheating. Before the appointment of the present commissioner of the Bureau of Weights and Measures of New York City, State Superintendent of Weights and Measures, Fritz Reichmann, estimated that the consumers of New York City were losing between \$2,000,000 and \$4,000,000 on short weights and measures. But the discoveries of Commissioner Clem Driscoll, appointed by Mayor Gaynor, have made it apparent that Superintendent Reichmann's highest figure was far below the truth. Commissioner Driscoll discovered that practically all the hucksters were giving short weight, and all of the necessities of life were used in some way to cheat customers.

Commissioner Driscoll's work has attracted widespread attention on account of his attacks on trade customs. Some of the reforms instituted by him have been insistence on the sale of ice by weight, the sale of eggs also by weight, and the abolition of many deeply rooted trade customs. By meeting with dealers in articles which were hampered by deceptive customs he was able to win their cooperation and bring some of the practices to an abrupt stop. In this respect he received the prompt support of the Federal Government, which ordered all short weight and short measure goods stopped at the customs house. Strict rules applied to all trades without favor have resulted in a general reform in many lines of business which had accepted limitations made by usage, the origin of which was in obscurity.

The general theory on which Driscoll attacked trade customs was expressed by himself. "Trade customs may be all right. But I haven't found one yet that works for the customer instead of the seller." Reduced to figures, Driscoll pointed out to the butchers of New York that the custom of placing skewers in meat was costing the consumers of New York 587,662 pounds a year. Potato barrels supposed to hold 174 pounds he found weighing only 140 pounds, and after a few months compelled honest weight.

The reform of trade customs is the most important portion of the crusade against short weights. The Pure Food Law did a great deal in this respect, but it was able only to affect goods sold in the original package, and applies only to food, while the field of the officers in charge of weights and measures have much wider latitude. Under the new régime, when cloth is marked "all wool and a yard wide," it must be what it is represented to be. All business has been affected by other trade customs, many of which grew out of the necessity for discounts which have long since ceased to exist, giving some party to the transaction an unfair advantage, but these are now being remedied.

Under the discretionary powers of their of-

fices, other officials besides weight and measure commissioners have found it possible to enforce laws of a similar character. One of the frauds which had grown to a surprising extent in the last few years was the reproduction of old furniture and selling it as the original. As most of this is imported from abroad, it must pass the custom house, and there it is soon discovered whether furniture is in reality antique or has been imported with the purpose of selling it as antique, although of clever modern manufacture. A large part of this furniture, however, is rebuilt from other furniture which was about to fall to pieces, but, unless the changes made have been minor, the custom house will not pass on it as old. Old furniture is permitted to pass in free and new furniture must pay duty.

Weihaiwei. A British territory, according to lease, situated in the Chinese province of Shantung, with a total area of about 285 square miles, and estimated population of 150,000. The British influence extends beyond the boundaries of Weihaiwei over a territory 1,500 square miles in extent. The Government is conducted under a Commissioner. He makes ordinances, subject to the approval of the State Secretary, for the colonies. The actual revenue for 1908-09 amounted to \$48,500, and the expenditure to \$98,500. The grant-in-aid for 1909-10 was \$24,000. Justice is administered in civil and criminal courts, appeal may be had to the Supreme Court of Hong Kong. The principal products of the territory are cereals, vegetables, fruits and silk. Rope-making and boat-building are among the industries. Some minerals exist, a gold mining company being in operation. The chief imports into Weihaiwei are kerosene, flour, cottons, sugar, timber, beverages and coal. The port is free.

Wellman Flight. See DIRIGIBLES.

Wesleyan Methodist Connection. An evangelical Christian denomination, organized in 1843, by anti-slavery members of the Methodist Episcopal Church. The church has made a steady growth in the past few years, and now has a membership of 19,485, including 570 ministers; and there are 605 congregations. In the work of the Sunday School there are 1913 teachers and officers, 487 schools, and 18,783 scholars. Houghton Theological Seminary, Houghton, N. Y., and Miltonvale College, Miltonvale, Kansas, are under the control of the denomination. The preparatory school, Central, South Carolina, is controlled by the local conference, and a similar school is also supported within the circuit of the Indiana conference. The *Wesleyan Methodist*, Syracuse, N. Y., is the official organ of the denomination.

Western Australia. A vast extent of country comprising a large portion of the continent of Australia, 1,480 miles in length, and 1,000 miles in breadth. The total area is about 975,900 square miles. The population in 1910 was 282,850. A Governor appointed by the Crown is in control of the Government, and is assisted by Executive and Legislative Councils. The revenue for 1909-10 amounted to about \$20,837,800, and the expenditure to \$19,245,500. The gross debt amounted to about \$113,526,000 in June 1910. The leading products of Western Australia are gold, wool, timber, pearls, silver,

lead, copper, tin, coal, iron, sandalwood, mallet bark for tanning, cereals, fruit, wine, horses, cattle, and hides and skins. The imports comprise a large number of articles such as sugar, tea, tobacco, machinery, clothing, etc. The exports for 1909 were about as follows: wool, \$5,065,000; timber, \$4,335,000; sandalwood, \$185,000; and hides and skins, \$805,000. Total imports in 1909-10 were valued at \$31,234,700, and the exports at about \$43,195,000. The exportation of gold was worth over \$10,809,000. There are about 3,000 miles of railway line open in Western Australia, and there is direct telegraphic communication with England and South Africa. Vessels entered at the ports in 1909 numbered 650, carrying 2,071,610 tons. Religious and educational advantages and privileges comport with the successful progress of the State, which the above figures render apparent.

Westinghouse, George, American inventor and manufacturer. b. Central Bridge, Schoharie county, N. Y., 6 Oct. 1816. When 10 years old he removed to Schenectady, N. Y., and was educated there in the public and high schools. His chief apprenticeship, however, was obtained in his father's machine shop, where he worked at the lathe and invented, at 15, a rotary engine. After serving in the 12th N. Y. National Guard, and 16th N. Y. Cavalry, in the Union Army, from June 1863 to Nov. 1864, and as assistant engineer in the navy from Dec. 1864 to Aug. 1865, he was for a year a student at Union College. Then he entered actively upon his career as an inventor.

His name is associated principally with the invention of the airbrake, largely on account of the surprise it occasioned when, as a young man of 22, he brought to the authorities of the Pennsylvania Railroad at Pittsburg an apparatus which, he said, would enable a locomotive engineer completely to control a train. The late Abram S. Hewitt said that "the discoveries and inventions of Sir Henry Bessemer and the apparatus devised by George Westinghouse made possible the opening up of the Greater West to exploitation and development. We could not have furnished the railroad facilities adequate for the agricultural commerce possible in the Greater West, had it not been for the steel rail and the airbrake." In addition to the conception of apparatus for the utilizing of a certain form of electric energy which had always been regarded as of relatively small value, he was compelled to spend many years in overcoming both commercial and scientific objections to the utilization of the electric energy of alternating currents of high voltage through the static transformer, so that this energy becomes equivalent energy at a lower voltage. Working in coöperation with others, he discovered how it would be possible to make an inert mass of metal capable of transforming alternating currents of 100,000 volts into currents of any required lower voltage, and doing so with the loss of only a trifle of the energy. As the pioneer in introducing alternating current machinery in America, he rendered possible the great development of water powers for long distance electric transmission. He built the great generators at Niagara Falls and those of the Elevated Railway and Rapid Transit System in New York.

With works in England, France and Germany, as well as the United States, for the manufacture of his machinery, these inventions, together with the subsidiary and allied industries which spring from them, represent a capitalization of nearly \$130,000,000. His airbrake company is capitalized at \$14,000,000, and has a surplus of nearly \$6,000,000. His automatic air and steel coupler company is capitalized at \$5,000,000, his electric company at \$60,000,000, his manufacturing company at \$10,000,000, and his British Electric Company at \$10,000,000. His achievements through his inventive genius his ability to secure capital, establish plants and develop business, have undoubtedly benefited the American people by an amount estimated in money value at many hundred millions of dollars. Mr. Westinghouse has received several foreign decorations, including the Legion d'Honneur of France, the Royal Crown of Italy and the Order of Leopold; he is also honorary member of the American Society of Mechanical Engineers, and one of the two living honorary members of the American Association for the Advancement of Science. These are the formal acknowledgments of his achievements from the point of view of the scientist. It is not possible to bestow like decorations or honorary distinctions in recognition of great business achievements; but figures such as those quoted above, and the fact that the various organizations created by him give employment to 50,000 skilled artisans and support to 300,000 persons, afford a basis for public recognition of his achievements.

It was in connection with the development of the electrification of railways that Mr. Westinghouse found his greatest obstacles from the commercial point of view and to some extent from that of science. Many men of science, who have deservedly gained high reputations, did not agree with him that the alternating currents could be so utilized as to secure the highest economic results in transportation of railway trains, both freight and passenger. How signally he triumphed is illustrated by the fact that a paper written by him was read in 1910 at the important meeting of mechanical engineers in London, in which he stated without qualification that the steam locomotive had reached the limit of its capacity and that the universal electrification of railways was at hand. To prove his faith, he entered into an elaborate exposition of the principle of standardization—a principle which he regards as essential before there can be complete electrification.

The fact that Mr. Westinghouse has been compelled to give up the presidency of the Westinghouse Electric Company, which he organized, built up and which bears his name, is not an indication of retirement from business. At the age of 65, his brain is apparently just as creative to-day as when he perfected the airbrake that made him famous. His latest inventions are an airspring for automobiles, and a geared turbine drive for vessels. The Bureau of Steam Engineering at Washington decided that the United States Navy must be the first to equip a ship with his geared turbine, and it designed one of the new steam colliers, which was being built in 1910 in Maryland, as the first vessel to use the new propelling engine.

Weston, Edward Payson, American pedestrian: b. Providence, R. I., 15 March 1839. On

WESTON — WEST VIRGINIA

2 May 1910, he completed a walk of 3,500 miles from Santa Monica, Cal., which he left on 1 Feb. 1910, to reach New York in 90 working days, not counting Sundays. He accomplished the undertaking in 76 days and 23 hours, or 13 working days less than the allotted time. To make his schedule he had to average 38 miles a day for 90 working days. He actually averaged $45\frac{1}{2}$ miles a day, and the last part of it was with a sprained ankle caused by being struck by an automobile. While on the trip between Ingalls and Garfield, Kans., on 14 March, he entered upon his 72d year, and in celebration of the event he walked 72 miles. His shortest walk for a day was 24 miles.

He walked as far each day on cinder roads as on good ones, and ate the same foods in all weather. He found he could eat almost anything he wanted and digest perfectly, even pie, griddle-cakes, or pudding. One of his maxims is "The stomachs that can't digest ordinary food are those that are spoiled by high living and no exercise." His dietary was as follows: Arising at 330 or 4 a. m., he had breakfast of oatmeal or other cereal, with plenty of milk; three poached eggs on two slices of buttered bread, and two or three cups of coffee; strawberries or prunes or a couple of oranges; and five or six griddle-cakes. He is a strong advocate for sugar as a creator of energy; and on his trip he ate from 12 to 18 eggs a day, each beaten up in a pint of milk and sweetened with a tablespoonful of sugar. Sometimes he took a little meat juice. At night he ate nothing unless very hungry, then only a bowl of milk and cereal. As a rule, he does not eat in the middle of the day, but while on his walk he took a hearty mid-day meal on Sunday when he had no work to do. Also, when the walking was good and he planned a long distance for his day's stunt, he would eat en route what he called his second breakfast—griddle-cakes, a couple of fried eggs and coffee—to carry him over the extra miles.

When he finished his day's walk he was ready for bed. He had his knees rubbed to keep off stiffness, and then slept for six hours. His prescription for keeping the feet in good condition is as follows: Dissolve a handful of Turk's Island rock salt (the kind used for freezing ice-cream) in a quart of boiling water. Add five or six quarts of cold water, and let it stand to reach the same temperature as the bedroom. Soak the feet in this before retiring, wiping them dry, then douse them with extract of witch-hazel, and allow them to dry. This cools the feet and makes them tough.

He believes walking is the perfect exercise, a sure cure for rheumatism, and as healing to the mind as to the body. For best exercise he advises one to walk naturally, to set the foot down flat and not heel first. He carries a short stick like a riding crop behind the back between the elbows. He never drinks alcohol. He never smokes on the road; nor does he drink water. His shoes are made with a broad toe and no tip, and one size larger than he wears in town, that is, loose enough to allow him to turn the toes under when the shoes are on. This admits enough air to keep the feet cool. The shoe, he believes, should fit only across the instep, then it will not bend the foot, for the shoes, which do the walking, should merely be guided by the foot

and leg. The heels of the shoes should be broad and low, and the sole extend under the heel. He advised against rubber soles, as it "parboils" the feet. He wears socks made of cotton, silk and wool.

West Virginia. A State of the South Atlantic division, having a population of 1,221,119, a gain of 27.4 per cent since 1900. The population per square mile is 50.8 per cent. The State has an area of 24,170 square miles. The capital is Wheeling, population, 41,641.

Agriculture.—The farm area of the State was 10,654,513 acres, of which about one-half is improved land. The acreage, production and value of important farm crops for 1910 is as follows: Corn, 23,920,000 bushels, acreage, 920,000, value, \$16,266,000; winter wheat, 5,125,000 bushels, acreage, 410,000, value, \$5,228,000; oats, 2,520,000 bushels, acreage, 100,000, value, \$1,260,000; rye, 155,000 bushels, acreage, 12,000, value, \$140,000; buckwheat, 575,000 bushels, acreage, 25,000, value, \$143,000; potatoes, 3,772,000 bushels, acreage, 41,000, value, \$2,527,000; hay, 810,000 tons, acreage, 675,000, value, \$12,150,000; tobacco, 12,800,000 pounds, acreage, 20,000, value, \$1,318,400. The farm animals of the State, on 1 Jan 1910, were horses, 197,000, average price per head, \$112, value, \$22,064,000; mules, 12,000, value, \$1,140,000; milch cows, 247,000, value, \$8,645,000; other cattle, 511,000, value, \$11,498,000; sheep, 709,000, average price per head, \$4.30, value, \$3,049,000; number of sheep at shearing age, 587,945; average weight of fleece, 5.75 pounds; per cent of shrinkage, 49; wool washed and unwashed, 3,380,684 pounds; wool scoured, 1,724,149 pounds; swine, 338,000, average price per head, \$7.70, value, \$2,603,000.

Mining and Manufacturing.—The production of coal in West Virginia for 1910 exceeded 60,000,000 tons, an increase of nearly 20 per cent over that of 1908. Most of this was in the counties in the southern portion of the State, although there was increased activity in the northern counties. An increase in the tide-water shipments of the Virginian railway and the new developments along its lines was a cause of the addition to this tonnage. There were 56,861 men employed in the mines, a majority of which were carried on under the open shop or non-union rules. Coke is another important mining product of the State. West Virginia ranks second. The production amounted to 2,637,123 short tons, and the average price per ton was \$2. The total value of the mineral products was \$77,465,737. Other minerals are building stone, lime, glass sand, sand and gravel, salt, Portland cement, iron-ore and zinc, and clay products. The petroleum area of the State is 570 square miles and the natural gas 1,000. West Virginia also has 672 wheels with 20,500 horsepower. The capital employed in the manufactures of the State amounts to \$86,820,823, and the value of the products to \$99,040,676; wages paid, \$21,153,042; wage earners, 43,758. There are many important leather industries in the State.

Government.—The Governor of West Virginia is William E. Glasscock, Rep., salary, \$5,000, whose term of office is four years, and expires on 4 March 1913. Other State officers are: Secretary of State, Stuart F. Reed; Treasurer, E. L. Long; Auditor, John S. Darst; Attorney-General, William G. Conley; all Re-

publicans. The composition of the Legislature is, Senate—Democrats, 15, Republicans, 15, House—Democrats, 63, Republicans, 23. The two United States Senators are Democrats. The Representatives in Congress are John W. Davis, William G. Brown, Adams C. Littlepage, John M. Hamilton, Democrats, and James A. Hughes, Republican.

Finance.—The State has no bonded debt. The aggregate debts of the cities, counties and minor civil divisions amount to \$4,767,776. Under the constitution it is provided that "no debts will be contracted by the State." During the last year reported, the receipts were \$3,065,631; disbursements, \$2,973,033, and National banks, 88, with 31,436 depositors, and \$9,828,084.21 deposits, State banks, 82, with 22,097 depositors, and \$6,777,101.78 deposits, loan and trust companies, 10, with 8,514 depositors, and \$1,196,884.06 deposits. There were 24,129 savings bank depositors, with \$4,125,519.47 deposits.

Religion and Education.—The religious denominations are as follows: Baptist, Northern, Southern and National Conventions, 60,365; Methodist, 61,641, Roman Catholic, 40,011, Methodist Episcopal Church, South, 36,632; Protestant Episcopal, 5,230, and Methodist Protestant Church, 16,004. The pupils enrolled in the common schools number 255,059, and the average daily attendance is 165,103. The number of teachers are 8,232. There are five universities and colleges, having 97 male and 21 female professors and instructors, and 1,144 male and 607 female students. The total income from tuition fees, productive funds and the Government is \$336,404. The value of the buildings is \$1,020,000, and of the productive funds, \$338,704.

Charities and Corrections.—There are 15 hospitals supported by public, private and ecclesiastical beneficence. There are institutions for the insane, minors, schools for the deaf and blind, and a county farm in each county which gives shelter, food, clothing and medical attendance to the poor. The overseers are appointed by the county court and they have jurisdiction over the poor. One year's residence is necessary for a pauper to obtain relief, but the parents, children, brothers, and sisters, are liable for his support. The population of the almshouses was 961, of whom 115 were colored. The disbursements for the penitentiary were \$276,131.60, of which \$103,803.28 was for salaries, \$76,442.89 for provisions, and for bedding and clothing, \$20,263.81. The earnings for the year were \$388,830.40, of which \$203,672 was received from contractors for labor, and \$76,803.56 for board for the United States prisoners. There were 1,224 prisoners as a daily average during the year.

Legislation.—The Legislature meets biennially, the session being limited to 45 days. There was a session in 1909 at which acts were passed establishing a department of public roads; creating a non-partisan board for the control of public institutions, empowering the United States to acquire land by purchase or condemnation for a national forest reserve; regulating the practice of optometry; making Lincoln's birthday a holiday; prohibiting the sale of merchandise in bulk in fraud of creditors; and establishing a home for children surrendered to the care or committed to the custody of the West Virginia Humane Society.

Wheat. The wheat crop of the United States is divided into two sowings, fall and spring, which, although they cover the same territory to some extent, belong largely to different geographical areas and are subject to different climatic accidents. The result is that one of the crops may be successful while the other is not. That was the case in 1910, the winter crop being a large one, while the spring-sown crop suffered from severe drought. The production of both crops, considered together, for 1910, was 691,767,000 bushels, or substantially the average of the preceding five years. The value, however, was \$625,000,000, which is 76 per cent above the five-year average. The quantity of the 1910 wheat crop has been excelled only four times, and the value excelled only once, in 1909, although the 1908 crop was nearly as valuable. During the 21 years which have elapsed since the census of 1889, the relative geographic distribution of the wheat crop has undergone perceptible change. In that interval, the fraction of the national crop produced in the North Atlantic States has declined from 68 to 59 per cent, in the North Central States, from 686 to 629 per cent, whereas there have been increases in the other geographic divisions—from 59 to 66 per cent, in the South Atlantic States; from 5.2 to 9.7 in the South Central States, and from 13.3 to 14.9 in the Western States.

White, Edward Douglass, Chief-Justice of the United States: b on his father's sugar plantation on Bayou La Fourche, in the Louisiana parish of La Fourche, 3 Nov. 1845. His father, Judge Edward Douglass White, was judge of the city court of Donaldsville, La.; a representative in the 21st and 22d and 26th and 27th congresses; and was governor of Louisiana, 1834-38. He attended Mt. St. Mary's College, Emmittsburg, Md., the Jesuit College at New Orleans, La., and Georgetown, D. C., College; but the outbreak of the Civil War, although only 17 years of age, he was withdrawn from the latter institution, and enlisted as a private in the Confederate service. He served on the staff of General Beale during the siege of Port Hudson, and was captured at the surrender of the place, 6 July 1863. He studied law in the office of Edward Bernudez, afterward chief justice of Louisiana, and was admitted to the bar in Dec. 1868. He was elected State Senator in 1872, served for four years, and was a strong supporter of Governor Nichols during the period preceding the recognition of the Nichols government at Washington. In 1876 he was appointed by Governor Nichols an associate justice of the supreme court of Louisiana, and remained in office until the adoption of the new constitution in 1879, which vacated all State offices. He managed the State campaign of 1887, which resulted in the reelection of Governor Nichols, and was nominated in the legislative caucus to succeed Senator James B. Eustis for the term beginning 4 March 1891. During his senatorial term, he was distinguished in the debate on the anti-option law, which he opposed, and in the struggle over the repeal of the Sherman act, when he advocated the views President Cleveland held on the subject. On 19 Feb. 1894, he was appointed by President Cleveland an associate justice of the United States Supreme Court, and his nomination was confirmed by the

WHITE—WHITE SLAVE TRAFFIC

Senate, 12 March 1894. Justice White was one of the largest individual sugar planters in Louisiana, and was reputed to be one of the wealthiest members of the New Orleans bar. He is a devout Catholic and the first of that faith to be appointed to the Supreme Court since the death of Roger B. Taney, who was the first ever appointed. He was nominated by President Taft Chief-Justice of the United States in 1910, and this nomination was immediately confirmed by the Senate. Justice White is the third Southerner to preside over this court, the other Southerners having been John Marshall, of Virginia, and John Rutledge, of South Carolina. He is also the only chief justice ever promoted from the Supreme Court bench, William Cushing, of Massachusetts, although nominated for chief justice while an associate justice in 1796, having declined the office.

White, Horace, American lawyer and politician: b. Buffalo, N. Y., 7 Oct. 1865. The son of wealthy parents, he took advantage of his opportunities of obtaining the best education possible to fit him for public life. After winning at Cornell the Memorial Prize for declamation in 1886, and the Woodford Medal for oratory, he was graduated as a Bachelor of Arts, in 1887, from this university of which is uncle, Andrew D. White, the former Ambassador, was president; and then studied law at Columbia Law School, and was graduated as a Bachelor of Laws in 1889. Since 1890 he has practiced law in Syracuse, N. Y., and is at present the senior member of the law firm of White, Cheney, Shinaman & O'Neill.

Drifting naturally into political speech-making, his rise in local politics was rapid under the political leadership of Francis Hendricks (former State Superintendent of Insurance and the local Republican boss) and of ex-United States Senator Frank Hiscock, in whose office he had begun the study of law. He went on the stump for both the State and national tickets in 1888, and, after eight years of activity in law and politics, was elected State Senator from the Onondaga-Madison district in 1895. He retained this position for six terms ending in 1908. He served several years as chairman of the committee on cities, in which capacity he drafted the White charter for second-class cities, and did much toward the revision of the charter of Greater New York.

Nominated by the Republican State Convention for Lieutenant-Governor, he was elected, 3 Nov. 1908, for the two years beginning 1 Jan. 1909; but before the expiration of this term Governor Hughes resigned, 1 Oct. 1910, to take up his new duties as an Associate Justice of the Supreme Court of the United States, and Lieutenant-Governor White became Governor, 1 Oct. 1910 to 1 Jan. 1911. While Lieutenant-Governor, he suffered from criticisms at the beginning of 1910, on account of his business methods in connection with the sale of the People's Mutual Life Insurance Association of Syracuse. This was a transaction in which, as attorney, he held money that was to have been turned over to the directors of the company. An investigation by Superintendent of Insurance Hotchkiss resulted in the introduction of a bill in the Legislature by the Insurance Department making it a crime for directors of a mutual company to take any money in considera-

tion for the sale of their interests. Mr White's friends asserted that he was an innocent party in the transaction, having acted solely in the capacity of attorney.

White Slave Traffic. Official recognition of the white slave traffic in Europe was taken first in 1902, when delegates from leading European countries met in Paris with the purpose of formulating a plan by which the traffic could be suppressed. Later, the plan was endorsed by official action, the United States not taking an active part until 1907, when a Congressional Immigration Commission was created to look into the matter.

Following the creation of this commission, United States attorneys in cities were instructed to follow white slave cases closely, with the purpose of deporting those concerned. It also developed at this time, as the result of investigations, that the white slave traffic was not confined to women imported from other countries, but was flourishing in American cities under the "cadet" system. In the fall of 1909, the white slave traffic was made a political issue in New York City and attained such wide notoriety that a special grand jury was appointed to investigate. John D. Rockefeller, Jr., was chosen as foreman and offered to finance the investigations, but the Board of Estimate, of New York, made an appropriation of \$25,000 for the purpose.

The work of this body was peculiarly difficult, as the procurers and "cadets" had been thoroughly warned by the publicity given the investigations and were not easily trapped. However, the special grand jury secured through investigators reports which showed the traffic to exist. The accusation having been made that a regular, organized traffic existed, the investigators attempted also to prove this, but found that absolute evidence was lacking. The report presented the court in part reads:

"It appears, from indictments found by us and from the testimony of witnesses, that trafficking in the bodies of women does exist and is carried on by individuals acting for their own individual benefit, and that these persons are known to each other and are more or less informally associated.

"We have also found that associations and clubs composed mainly or wholly of those profiting from vice, have existed and that one such association still exists. These associations or clubs are analogous to commercial bodies in other fields, which, while not directly engaged in commerce as a body, are all as individuals so engaged.

"The only association composed mainly or wholly of those profiting from vice, of the present existence of which we have any evidence, is the New York Independent Benevolent Association, organized in this city in 1894, and incorporated in 1896. The association has had an average membership of about 100. Its alleged purpose is to assist its members in case of illness, to give aid in case of death, and to assure proper burial rights.

"After an exhaustive investigation into the activities of the association and of its members, we find no evidence that the association as such, does now or has ever trafficked in women, but that such traffic is being, or has been, carried on by its members, as individuals.

WHITE SLAVE TRAFFIC—WICKERSHAM

"We find that the members of this association are scattered in many cities throughout the United States. From the testimony adduced, it seems probable that the social relation of the members and the opportunity thereby afforded of communicating with one another in various cities have facilitated the conduct of their individual business."

Cases were found by this body showing that women had been sold at regular prices as low as \$60. These women were partly foreign and partly native. Some were white slaves in the strict use of the term, women who were completely under the domination of men, and others merely submitted to protection from men who either kept them out of trouble with the police, or pretended to be in a position so to do.

The same general state of affairs is borne out by the Congressional Commission which established that women were regularly brought into this country to be sold as prostitutes. This committee confined itself to the purpose for which it was created, to determine the extent of the importing of women, and did not take up the question of white slavery as related to native-born women. They showed that women are regularly enticed to this country under the promise of high wages and are in reality sold into the white slave traffic. For this purpose London has served as a centre and the women, before being brought in, are subjected to rough treatment which effectively cowers them and prevents them from appealing to the police for protection. Once in this country, they are distributed through dealers in New York, Chicago, Omaha, San Francisco, Los Angeles and Seattle. One dealer, Alphonse Dufaur, according to his account books, cleared over \$100,000 a year on the traffic.

The importation of women having been stopped to a large extent by immigration officials, the amount of white slavery as related to American girls has increased and has attained proportions in the cities which are calling for action. In view of this fact, Attorney-General Wickersham has ordered a thorough investigation of the white slave traffic in all its aspects, and will attempt to eradicate the evil. The preliminary investigation made by him shows that there is no doubt as to the existence of the evil, and the work of his assistants will be principally to ferreting out the organizations and individuals engaged in the traffic and compelling them to cease. States are attempting to meet the condition in a similar manner.

The Committee of Fourteen, organized for the purpose of suppressing that class of hotels in New York, which became adjunct to saloons to meet the requirements of the Raines Law compelling Sunday closing, has pointed out the close relationship between these hotels and the illegal traffic in women. Police grafting and the opportunities for blackmail where there is no control of vice, such as now exists in most American cities, are held largely responsible for the ease with which women are held in practical or actual slavery, through either fear or duress.

Employment agencies, fraudulently conducted, have been found by Federal detectives to be a chief source of the white slave traffic. After working several months under the direction of the Department of Justice in all the large cities of the country they made reports,

varying only in detail, showing that white slavery in the restricted sense of the term existed in all the larger cities of the United States.

Contrary to the findings of the Rockefeller Grand Jury in New York, their preliminary investigations showed that the traffic was highly organized and, although little of it was ever reduced to writing, regular communications took place between agents located in all the principle centres of population. Chicago and Pittsburg were found to be the disseminating points from which the women are shipped to more remote localities.

Aside from the European immigrant girls who are the readiest victims to this crime, the Federal investigators discovered that there is a regular white-slave traffic along the Mexican border. Here women are sold to the highest bidder by the importers, the women not understanding the transaction until it is too late.

To suppress the traffic effectually, the Federal officers having the crusade in charge have secured a census of all the foreign women employed in prostitution and are keeping in touch with their movements. Simultaneously in all the larger cities these women will be investigated and their census retaken, to secure a list of those not previously recorded and determine the number of new arrivals. The agents of the Government to secure evidence will be compelled to seize witnesses at once, when the crime is discovered, and the Government is prepared to provide them with shelter while the trials progress.

Under the Mann law, which enables the investigation, the Federal Government cannot interfere except in cases where the white slave has been moved from one State to another. But, since this is usually the case, the difficulty will occur only in following the women to the State into which they have been sold. The Department of Justice expects to continue prosecutions under the new law until white slavery, as far as it relates to interstate traffic, is entirely eradicated.

The Young Women's Christian Association has gathered statistics which show that 1,700 girls are each year lost to their friends and parents in the trip from New York to Chicago and Chicago to New York. A large percentage of these girls are believed to be led astray by not receiving proper attention. The amount of work which is necessary to look after traveling young women and prevent them from falling into evil hands is so great, however, that the Y. W. C. A. is unable to cope with it. In many cities local organizations are maintained which are devoted to this particular work, and it is a matter of common knowledge among charity workers that all homes for working women and shelter for homeless girls are always crowded. It has been stated that 35,000 innocent girls are annually mistreated, drugged and sold into white slavery each year in the United States, for prices ranging between \$15 and \$500. Increasingly heavy sentences have been imposed against men found guilty of attempting to lead girls into an evil life. In New York the usual punishment is from five to ten years in the penitentiary. The tendency is to impose increasingly heavy sentences.

Wickersham, George Woodward, American lawyer and Government official. b. Pittsburg, Pa., 19 Sept. 1858. He was a student at

WIDOWED MOTHERS' FUND ASSOCIATION — WILSON

Lehigh University, 1873-75, from which institution he received the degree of LL.D. in 1909. He practiced law at Philadelphia, 1880-82, and then removed to New York, entered the firm of Strong & Cadwalader in 1887, where he was counsel for many important interests, among others the Interborough Rapid Transit Company and the Mexican National Railway Company. On 4 March 1909, he entered the cabinet of President Taft as Attorney-General of the United States, and ably represented the government in the great arguments before the Supreme Court for the dissolving of the Tobacco Trust and the Standard Oil Company, in Jan 1911.

Widowed Mothers' Fund Association.

This organization, the purpose of which is to keep Jewish families together after the death of the father, held its annual meeting in New York in November. Joseph Barondess said there were 700 children of Jewish parents put in institutions which were not Jewish, while the Jewish people, who were supposed to be orthodox, were building synagogues and leaving the children of their poor under Christian influences. Samuel Strasbourger said incorrigibles could not be kept in orphan asylums. "There are 1,000,000 Jews in New York," he continued, "and of that number there should be 25,000 who could each afford to give \$10 a year to different charities. As it is, only 5,000 or 6,000 are giving to many charities. When a man gives to one, he does not like to be asked to give to all. Don't get the books of other institutions to find out the names of people to ask for contributions. Make up your own list. You ladies have more time than we men, and, if you go from door to door to ask, you will not be thrown out, as we would be. There is no better work than this work you are doing on the face of the earth."

Wiley, Harvey Washington, American chemist. b Kent, Ind., 18 Oct 1844. He was graduated from Hanover College in 1867 and the Indiana Medical College in 1871, receiving the honorary degrees of Ph.D. (1876), and LL.D. (1898) from Hanover. He taught chemistry in several western colleges, held the office of State chemist of Indiana 1874-83, and was appointed chief chemist of the United States Department of Agriculture in 1883, which office he still holds with high distinction. In connection with it he has been professor of agricultural chemistry in the George Washington University since 1899. He is a member of many scientific societies, American and foreign, and has received many medals and honors. He is best known for his valuable work for pure food, and his many government bulletins and reports, together with his book on 'Foods and Their Adulterations' (1907), have had a wide circulation.

Willett Memorial. A movement was set on foot in New York City during 1910 which will result, probably some time in 1911, in the erection of a memorial tablet to Captain Thomas Willett, who was the first mayor of New York City. Captain Willett, although the first mayor of New York, is at present almost the only man that has ever held the mayoralty who remains unremembered by public sentiment. Captain Willett's remains are buried at Seekonk, which, in his time a part of New York State, is now a part of East Providence, R. I. No

portrait of New York's first mayor is positively known to exist, and a search is now being made through historic sources for such a picture, in order that facsimile may be cast upon the proposed tablet. Captain Willett was Assistant Governor of New York from 1661 to 1664, when the English conquered New Amsterdam. It was in 1665 that he became mayor of New York and two years later was chosen to succeed himself. He died at the age of 64, on 4 Aug 1674. The funds to provide the tablet to his memory will probably be raised by public subscription as soon as a suitable portrait can be found.

Williams, Charles David, fourth P. E. bishop of Michigan and 228th in succession in the American episcopate. b Bellevue, Ohio 30 July 1860. He was graduated from Kenyon College A.B. 1880, was ordered deacon in 1883 and ordained to the priesthood in 1884; was rector at Fernbank and Riverside, Ohio, 1884-89; and at St. Paul's, Steubenville, Ohio, 1889-93. He was dean of Trinity Cathedral, Cleveland, Ohio, 1893-1906, when, on Nov. 16 of the latter year, he was elected bishop of the diocese of Michigan to succeed the Rt. Rev. Thomas Frederick Davis, who died 11 Nov. 1905. He was consecrated 7 Feb 1906, Bishops Tuttle, Jaggard and Vincent presiding. He was president of the Cleveland Library Board, chaplain of the National Guard of the State of Ohio 1893-96; a member of the standing committee of the diocese of Ohio, and a delegate to the general conventions of the Protestant Episcopal Church since 1895. The honorary degree of A.M. was conferred on him by Kenyon College in 1893, that of D.D. in 1894 and L.H.D. in 1906 by the same institution, and LL.D. by Hobart College in 1907. He is the author of 'A Valid Christianity for Today,' and several reviews and addresses.

Willson, Augustus Everett, American politician. b Maysville, Ky., 13 Oct. 1846. He was graduated from Harvard in 1869, studied law, part of the time at the Harvard Law School, and was admitted to the bar in 1870. In Dec. 1875 Secretary Bristow appointed him chief clerk of the Treasury Department, which he held for six months. He was four times the Republican nominee for Congress and delegate an equal number of times at Republican National Conventions. In 1907 he was elected Governor of Kentucky by a majority of 18,053 votes, his term to expire 1 Dec. 1911.

Wilson, Harry Leon, American editor and author. b Oregon, Ill., 1 May 1867, member National Institute of Arts and Letters, editor of Puck 1896-1902; and writer of the following popular books: 'Zig Zag Tales' (1896); 'The Spenders' (1902); 'The Lions of The Lord' (1903); 'The Seeker' (1904); 'Ewing's Lady' (1907); 'The Man From Home' (in collaboration with Booth Tarkington) (1908). He is married to Rose Cecil (O'Neill) Latham, the well-known author and illustrator.

Wilson, Woodrow, American educator and author. b Staunton, Va., 28 Dec 1856. He was graduated from Princeton in 1879, and studied law at the University of Virginia, 1879-80; received the degree of Ph.D. from Lake Forest, LL.D. from many universities and Litt.D. from Yale. He practiced law at Savannah, Ga., for two years and then went to

Bryn Mawr as professor of history and political economy, (1885-88), in 1890 he became professor of jurisprudence and politics at Princeton, and in 1902, on the resignation of Doctor Patton, became president of the University. He resigned in the early fall of 1910 to conduct a campaign for the governorship of New Jersey, which he waged with such vigor and clearness of thought that he was elected to that office by a very large majority. The very first act of his administration was an endeavor to establish the efficacy of the new primary law by advocating for the United States Senatorship the previously expressed choice of the people. Doctor Wilson is a member of many historical and economical associations, and author of many books. His principal works are 'Congressional Government, a Study in American Politics' (1885); 'The State-Elements of Historical and Practical Politics' (1889), 'Mere Literature and Other Essays' (1893); 'George Washington' (1896), and 'A History of the American People' (1902).

Window Glass Trust. See TRUSTS.

Windward Islands. In the British West Indies, forming the sixth group in the colony, and consisting of Grenada (area 133 square miles); the Grenadines (about 10 square miles), St. Vincent (132 square miles), and St. Lucia, (233 square miles). The total population, about 176,000. The Commander-in-Chief and Governor of the Windwards reside at St. George's, Grenada. Each division of the colony has its own local government, with Governors and Councils. The latest statistics of revenue give that of the Windward Islands as \$824,750, and the expenditure as \$798,250. The public debt in 1909 amounted to more than \$1,387,000. The imports reached the value of about \$3,512,500, and the exports were approximately \$3,030,000. Tonnage entered at the ports in 1908, 3,092,800 tons.

Wines, Diseases of. Wines are made "sick," and various diseases of wines have to be treated in different ways. Francis C. Neale, of New York, brought suit in 1910 because his store wines were made "sick" by steam-heating pipes outside his cellar. His cellar was like the "caves" of the French—consisting of great cave-like recesses, deep in the earth, with double and triple doors to keep out rays of daylight and keep in an even temperature of 70 degrees.

One of the "diseases" of wines is too great acidity. This is treated with tartrate of potash, or with sugar and powdered limestone (a prescription that was known to the ancient Romans). Putrefaction of the grapes by heat is prevented, in Southern wine lands, by plaster of paris, which also prepares the wine sooner for bottling. These medicaments need not remain in the finished product.

A writer on "sick" wines explains that: "Jobbers know that wine is a nervous creature and needs the rest cure. Cellars must be free from noise and jarring. Cannonading in the Franco-Prussian War caused more than one fit of wine-cellar hysterics. The butler's preserving the cobwebs on an old bottle means only proof that it has been undisturbed, the cobwebs have no value. Dr. S. Weir Mitchell tells of an old-time Philadelphian who berated a friend for 'bruising a bottle of Madeira by bringing it in his coat-tail pocket on horseback to a drinking party.'"

"With all the care that may be taken, wines, like people, degenerate in unfavorable environment, and harder stocks supplant them. This happened in France, when American wines were imported to withstand the phylloxera that was killing the native stock. It must delight Darwinists to see how the new wines produced the old flavor, proving that environment—the sun, the soil, and the cellar—and not the stock,—gave the wine its character. Only in some of the most famous vineyards, whose juice is bottled old, was the experiment deemed too hazardous."

Wireless Telegraphy and Telephony. Great progress has been made in all departments of wireless message-sending during the past few years, indeed, it might almost be said that all the improvements of note have been accomplished within that period. Both of these methods depend upon wave propagation in the ether (not air) and both have electric and magnetic components. The electric waves which are used in propagation are from three to five hundred feet in length, and range from several million to 100,000 per second, or even lower. There are many types of transmitters and receivers, but it is unnecessary for our present purposes to describe their construction in detail.

Alternations of very high frequency are required in order to send wireless messages, in the production of which Nicola Tesla has played a large part. Great power is generated and used in some of these sending stations. Thus, Balslie employs a revolving cylinder, fitted with two rows of teeth, which move between fixed teeth. A tension of some 15,000 volts is employed. Fessenden, in the stations of the United States navy, employs a rotary disk apparatus, and the tension runs from 12,500 to 25,000 volts.

Dr. H. Marchand, in a recent article on this subject, (*Scientific American Supplement*, 17 Sept. 1910); says:

"The most important of recent improvements in methods derived from that of Poulsen have been introduced by Jeance and Colin, who have succeeded in establishing regular telephonic communication over unprecedented distances. These experimenters have ingeniously overcome the difficulties of the Poulsen method and utilized all of its advantages by producing the arc in an atmosphere of hydro-carbon vapors between a thin carbon pencil and a copper bowl cooled by circulation of water. The waste of the carbon pencil is exactly compensated by a deposit of carbon resulting from the dissociation of the hydro-carbons, and the operation is perfectly uniform when the apparatus has once been adjusted. Three arcs in series are used, with an aggregate tension of 700 volts.

"Collins uses an arc of from 2,500 to 5,000 volts, formed between two disks rotating in a transverse magnetic field, which elongates the arc by 'blowing.' Jeance and Colin reject this artifice, deeming that its only useful effect is to fix the arc at a definite point. The Collins process, with others invented by De Forest and Fessenden, have been submitted to the United States navy. Collins estimates that his method will satisfy the required conditions of operation over one hundred miles, without regulation, for five minutes. He is now making an exhaustive study of the phenomena of the elec-

WIRELESS TELEGRAPHY AND TELEPHONY

tric arc, and experimenting with a new electro-thermic detector”

Other companies—especially German—employ other methods, obtaining radiant energy in the form of sustained waves, from the secondary current. Many of the new methods differ radically from the old ones, and the efficacy in the newer systems is much higher.

In the methods which employ sustained waves, direct repulsion by a telephone receiver is not possible, because the frequency is too great to produce an audible sound, and the waves do not form periodic trains, like the waves formed by the ordinary spark. The function of the instrument called the “ticker” is to interrupt these sustained waves in such a manner as to produce sound in the telephone. To dispense with the ticker is the object of the projections introduced in the discs of the Marconi apparatus, and of various devices employed by Balsillie, Fessenden and others. It is desirable to eliminate this accessory in order that all stations may be able to communicate with each other, and it is largely because this desideratum is not satisfied by the Poulsen method that this method has met with much opposition and has not come into extensive use.

The ticker can be dispensed with when, as in the methods of Marconi, Balsillie, etc., an oscillating system is employed which produces waves of periodically varying amplitude. A simple method of satisfying this condition, which is used for important stations in the Peukert system, consists in employing an alternator of such a frequency,—500 cycles per second, for example,—that an audible sound is produced by the successive groups of waves.

In this case the telephone gives a musical sound, which is very agreeable to the ear and makes the signals clearly distinguishable from noises produced by disturbing influences. The same system is employed by Fessenden with the rotary interrupter. The discharging points are so arranged that they produce one discharge from each alternation of the current.

“Rectifying and electrolytic receivers are still being studied. Jegou has devised an electrolytic receiver which requires no battery. For wireless telephony, thermo-electric detectors and vacuum tube detectors, based on the Edison effect, appear to find much favor. On the other hand, Rossi has constructed a very simple electro-magnetic receiver, a sort of bifilar Einthoven galvanometer, and DeForest has devised a multiple hysteresis detector, a modification of that of Marconi. Balsillie employs a similar apparatus which, he claims, is as sensitive as the best of the known receivers, and is, at the same time, far less delicate and more regular in operation. Collins announces the completion of a thermo-electric detector sensitive to oscillations, the energy of which is only 1-5000 erg.”

There are numerous working methods, for which many patents have been taken out. When wireless telegraphy was in its infancy, many practical difficulties were caused by the imperfection in the transmitting apparatus, but these are being one by one overcome. Many, however, remain. In methods employing the arc, which is not formed instantaneously, it is impossible to control the circuit directly by the transmitting key. The general practice is to produce a continuous train of waves and to give the signals by modifying their frequency. Various

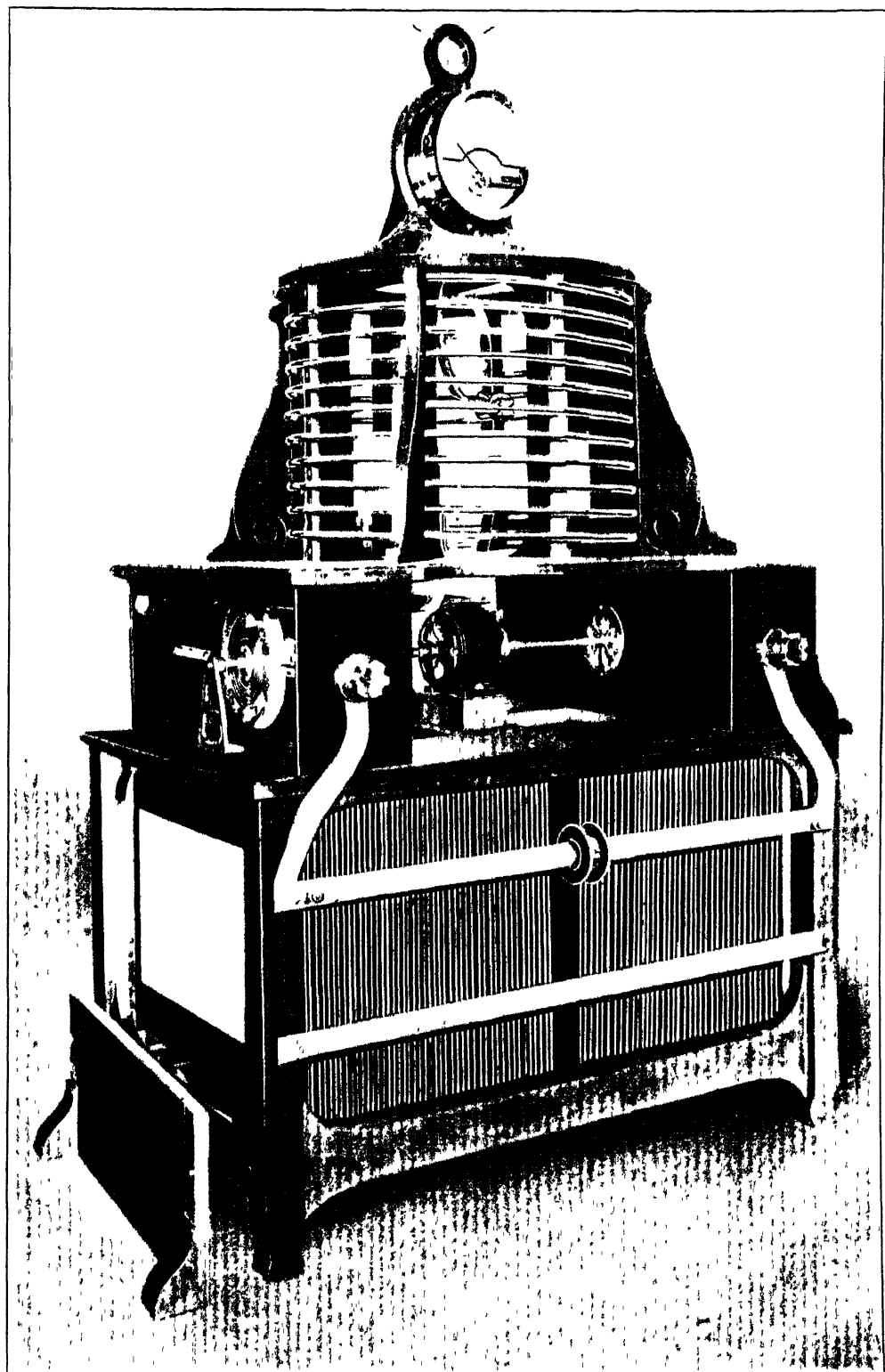
devices have been invented for this purpose: alternation of resistants and other electric constants, interruption of the current of hydrocarbon vapor in which the arc is formed, etc. The composition of the hydrocarbon mixture may also be varied. The employment of short sparks greatly simplifies the question, and that is an especial advantage of this method, in which it is necessary to generate waves only during the passage of each signal, instead of maintaining a continuous electric discharge. In Balsillie's system, as in ordinary telegraphy, the key acts directly on the transmitting current, and also serves as a commutator in passing from transmission to reception. For the arc system, Peukert inserts the key as a shunt to the arcs. This produces regularity to perfection, but diminishes the efficiency.

In wireless telephony, there are various systems of influencing the radiations by the use of the microphone. In the simplest method, which has been adopted by DeForest, Fessenden, Poulsen, Majorana and others, the microphone is intercalated in the circuit of the transmitting antenna, so as to vary the ohmic resistance of the circuit. This process, however, can be used only for communication over a very short distance with small power. For, with the exception of a few types, microphones, as now constructed, cannot well be used continuously with currents of more than one ampere.

In another method, the microphone acts inductively on a coil inserted in the antennæ circuit, but the variations of amplitude thus obtained are too small for long distance transmission. It has been suggested that a microphone be placed as a shunt to the battery. In this way a powerful current can be modified by means of an ordinary microphone, but this arrangement is not satisfactory in point of efficiency. Other systems have been devised by Fessenden, DeForest, Collins and Majorana. Jeance and Colln employ a number of microphones containing no combustible matter, which are connected between the earth and a properly selected point of a Tesla coil connected with the antenna. The current which flows through this branch circuit is regulated by the insertion of a variable resistance, inductance, and capacity, so that its strength is one-tenth that of the main antennæ circuit. Using instruments capable of supporting a current of 0.8 ampère, Jeance and Colln found no difficulty in modulating the electric energy required for telephonic transmission over a distance of 150 miles.

The work of Marconi in this field has been brilliant and is well known. In the spring of 1903, a systematic exchange of messages was established between England and America, and for several weeks the *London Times* published messages from its New York correspondent which had been sent by wireless. The service was only stopped by a serious breakdown, resulting from a fire there which crippled the apparatus for several months. In Oct. 1907, however, communication was established between Glace Bay in Canada and Clifden in Ireland, and this has been used commercially ever since. Messages have also been sent from England to Gibraltar. In the latter case, it was found that no serious impediment was offered by mountainous heights, such as the Alps and Pyrenees, during the night time, but that they did interfere to some extent during the

WIRELESS TELEGRAPHY



20 K W TRANSMITTER, MASSIE SYSTEM.

WIRELESS TELEGRAPHY AND TELEPHONY

day. Experiment showed that the range at night might even be doubled over that of the day. For some time this was not understood, and Marconi, writing of this phenomenon, says

"I do not think that this effect (the increased range at night) has yet been satisfactorily investigated or explained. At the time I carried out the tests, I was of opinion that it might be due to the loss of energy at the transmitter, caused by the dis-electrification of the highly charged transmitting elevated conductor under the influence of sunlight. I am now inclined to believe that the absorption of electric waves during the daytime is due to the ionization of the gaseous molecules of the air effected by ultra-violet light, and as the ultra-violet rays, which emanate from the sun, are largely absorbed in the upper atmosphere of the earth, it is probable that the proportion of the earth's atmosphere which is facing the sun will contain more ions and electrons than that portion which is in darkness, and therefore, as Sir J. J. Thompson has shown, this illuminated and ionized air will absorb some of the energy of the electric waves. Apparently, the length of wave and altitude of electrical oscillations have much to do with this interesting phenomenon, long waves and small amplitudes being subject to the effect of daylight to a much lesser degree than short waves and large amplitudes. According to Professor Fleming, the daylight effect would be more marked on long waves, but this has not been my experience. Indeed, in some very recent experiments, in which waves about 8,000 m long were used, the energy received by day was usually greater than at night. The fact remains, however, that for comparatively short waves, such as are used for ship communication, clear sunlight and blue skies, though transparent to light, act as a kind of fog to these waves. Hence the weather conditions prevailing in England, and perhaps in this country (Sweden) are usually suitable for wireless telegraphy."

In a recent address, given on the occasion of the awarding to him of the Nobel prize, Marconi further says, in speaking of the newer improvements in wireless telegraphy

"With regard to the receivers employed, important changes have taken place. By far the larger portion of electric wave telegraphy was, until a few years ago, conducted by means of some form or other of coherer, or variable contact, either requiring tapping or self-restoring. At the present day, however, I might say that in all the stations controlled by my company my magnetic receiver is almost exclusively employed. This receiver is based on the decrease of magnetic hysteresis which occur in iron, when under certain conditions this metal is subjected to certain effects of electrical waves of high frequency. It has recently been found possible to increase the sensitiveness of these receivers, and to employ them in connection with a high-speed relay, so as to afford messages of great speed.

"A remarkable fact, not generally known, in regard to transmitters, is that none of the arrangements employing condensers exceeds in efficiency the plain elevated aerial or vertical wire discharging to earth through a spark-gap, as used in my first experiments. I have recently been able to confirm the statements made by Professor Fleming in his book, 'The Principles of Electric Wave Telegraphy,' (1906, p. 555),

that with a power of 8 watts in the aerial it is possible to communicate to distances of over 100 miles. I have also found that by this method it is possible to send signals 2,000 miles across the Atlantic with a smaller expenditure of energy than by any other method known to myself."

The only drawback to this arrangement is that, unless very large aerials are used, the amount of energy which can be efficiently employed is limited by the potential, beyond which brush discharges and the resistances to spark-gap begin to have a deleterious effect. By means of spark gaps in compressed air and the addition of inductance coils placed between the aerial and earth, the system can be made to radiate very pure and slightly damped waves, eminently suitable for sharp tuning. In regard to the general working of wireless telegraph, the widespread application of this system, and the multiplicity of the stations, have greatly facilitated the observation of facts not easily explainable. Thus it has been noticed that an ordinary ship station utilizing about half a kilowatt of electrical energy, the normal range of which is not greater than 200 miles, will occasionally transmit messages across a distance of over 1,200 miles. It often occurs that a ship fails to communicate with a nearby station, but can correspond with perfect ease with a distant one.

The increase in the number of wireless telegraphic stations installed during the past few years has been very great. Five years ago, not a single vessel was equipped with an instrument of the kind; to-day, the warships and ocean liners of every country are equipped with a wireless outfit. Wireless messages are now sent across the Atlantic, as well as shorter distances over land and water, and the time is not far distant when the entire earth will be encircled with wireless-telegraph stations, and messages will be sent from one continent to another with comparative ease. The International Bureau of the Telegraphic Union, indeed, at Bern, Switzerland, declared nearly a year ago that several hundred stations were then in active operation. In the "list of stations" issued by them, it is said.

"This list contains stations in 20 countries. There are at this moment 128 coast stations and 579 floating stations, of which 365 are on war ships and 214 on marine vessels. The Marconi and Telefunken systems are those chiefly represented, the former by 191, the second by 207 stations.

"There are 35 coast stations in Great Britain, 23 in Italy, 15 in Germany, 13 in Russia, 7 in Denmark, 5 in Japan, 4 in Mexico, 4 in Norway, 4 in the West Indies, 3 in Chile, 3 in Holland, 3 in Austria-Hungary, 2 in Uruguay, 1 in Belgium, 1 in Brazil, 1 at Gibraltar, 1 in Malta, and 1 in Roumania.

"As for stations on merchant vessels, Great Britain has 86; Germany, 65; Holland, 15; Italy, 15; Belgium, 10; Japan, 10; Rumania, 5; Denmark, 4; Russia, 2; and Norway, 2. The French stations are not mentioned in these statistics, as the French Government has recently joined the International Telegraphic Union.

"It should be added that the establishment of numerous stations is now contemplated in South Africa, Australia, New Zealand, and in several of the Pacific Islands, and that the stations of Las Palmas and Santa Cruz at

WIRELESS TELEPHONE—WISCONSIN

Teneriffe, erected by a French Company, began regular service at the end of January 1910."

Within the past few weeks, an important addition to our knowledge of wireless telegraphy has been made in the work of Lapel, a German inventor who first made public the results of his experiments in Paris—owing, apparently, to difficulties between the inventor and the German Government. The effects of atmospheric disturbance and interference by other electric instruments are said to have been entirely overcome. Instead of the Morse alphabet, it is stated that musical notes are successfully employed in sending the messages. At the receiving end, the violent emission of electric sparks from the apparatus is also entirely obviated. M. Lapel's patents have become the property of the French Government.

In a recent heated discussion, the question was raised as to whether or not the late experiments in wireless telegraphy in the Mediterranean had any effect upon the unfavorable weather in the Southern part of France, and Southwestern Europe generally. The majority of scientific opinion seems to be against this view; but some facts were advanced in favor of it. Further evidence will have to be forthcoming before any definite decision can be arrived at, for or against.

Wireless Telephone. See WIRELESS TELEGRAPHY AND TELEPHONY.

Wireless Torpedoes. See TORPEDOES, WIRELESS.

Wisconsin. A State of the East North Central division, having a population of 2,333,860, a gain of 128 per cent over 1900. The population per square mile is 422 per cent. The area is 56,040 square miles, of which 54,450 is land. The capital is Madison, population 25,531.

Agriculture.—The farms in the State number 176,546, of which 10,475 are 19 acres and under, 23,366 from 20 to 49 acres, 53,868 from 50 to 99 acres, 58,312 from 100 to 174 acres, 29,423 from 175 to 499 acres, 963 from 500 to 999 acres, and 133 of 1,000 acres and over. There are 175,979 white farmers, and 567 colored. The owners number 150,534, of which 73,474 own without incumbrance. The tenants are 24,554. The total acreage is 21,012,000 of which 11,882,000 acres are improved. The land and buildings are valued at \$1,179,558,000, the value of implements and machinery is \$52,784,000, and the expenditures for labor \$25,344,000, and fertilizers \$121,000. The acreage production and value of the important farm crops in 1910 were as follows: Corn, 51,188,000 bushels, acreage, 1,575,000, value, \$26,618,000; winter wheat, 1,340,000 bushels, acreage, 67,000, value, \$1,233,000; spring wheat, 2,319,000 bushels, acreage, 124,000, value, \$2,133,000; oats, 69,136,000 bushels, acreage, 2,320,000, value, \$23,506,000; barley, 22,429,000 bushels, acreage, 866,000, value, \$14,355,000; rye, 4,880,000 bushels, acreage, 305,000, value, \$3,465,000; buckwheat, 196,000 bushels, acreage, 14,000, value, \$147,000; flaxseed, 180,000 bushels, acreage, 18,000, value, \$396,000; potatoes, 24,700,000 bushels, acreage, 260,000, value, \$9,386,000; hay, 3,625,000 tons, acreage, 2,369,000, value, \$34,800,000; tobacco, 31,710,000 pounds, acreage, 30,200, value, \$2,378,250. The farm animals of 1910 were as follows: horses, 669,000, value, \$80,949,000; mules, 5,000, value, \$575,000; milch

cows, 1,506,000, value, \$55,125,000; other cattle, 1,081,000, value, \$17,728,000; sheep, 1,034,000, value, \$4,653,000; the number of sheep at shearing age, 850,000; average weight of fleece is 65 pounds; per cent of shrinkage 48; wool washed and unwashed, 5,525,000 pounds, wool scoured, 2,873,000 pounds, swine, 1,651,000, value, \$19,482,000.

Mining and Manufacturing.—The mineral products of the State are valued at \$11,052,151. The most important is stone, which was valued at \$2,850,920. There were 6,084,571 gallons of mineral water produced at the value of \$1,413,107. The clay products were valued at \$958,395. Zinc is also an important product, its value for the year being \$1,648,572. There were 733,993 tons of iron-ore, coke and lime are produced in small quantities. Other mineral products are lead, cement, metallic paint, sand and gravel, graphite, pig-iron and crystalline quartz. The capital employed in the manufactures of the State is \$412,647,051; value, \$411,139,681; wages paid, \$71,471,805, wage earners, 151,391. Lumber is the leading industry, with 725 establishments capitalized at \$46,543,787, and products of the value of \$55,605,971; wage earners, 32,845; wages, \$16,084,515. Another important industry is cheese, butter and condensed milk. These establishments number 2,360, capital, \$5,897,418; value of product, \$29,994,791; wage earners, 2,299, wages, \$1,328,076. The foundry and machine shop industry is composed of 330 establishments, capitalized at \$47,946,755, and the value of the products, \$29,908,001. Flour and grist mill products, and tanned, curried and finished leather, are also important State industries.

Fisheries.—The value of the products is \$1,067,169; the value of the apparatus of capture \$407,277. There are 2,011 persons engaged in fishery industry; the vessels used number 80, and the boats 1,200. Trout is the most important, the catch being 4,710,100 pounds of the value of \$340,360. Other fish are herring, 12,123,900 pounds, valued at \$322,430; buffalo, \$103,480; white fish, \$56,320; pike and pickerel, \$22,600; lake perch, \$54,730; and crawfish, \$13,930.

Government.—The Governor of the State is F. C. McGovern, Republican, salary \$5,000, term two years, expiring Jan. 1913. Other State officers are: Lieutenant-Governor, Thomas Morris; Secretary of State, James A. Frear; Treasurer, Andrew H. Dahl; Attorney-General, L. H. Vancroft, all Republicans. The composition of the State Legislature is as follows: Senate—Republicans, 27; Democrats, 4; Social Democrats, 2; Assembly—Republicans, 59; Democrats, 29; Social Democrats, 12. The United States Senators are Isaac Stephenson and Robert M. LaFollette. The Representatives in Congress are Henry A. Cooper, John M. Nelson, Arthur W. Kopp, William J. Cary, John J. Esch, James H. Davidson, E. A. Morse, and Irvine L. Lenroot, Republicans, and M. E. Burke, and T. F. Konap, Democrats, and Victor L. Berger, Socialist.

Finance.—The bonded debt of the State created in 1861-63 during the Civil War, has been paid or converted into certificates of indebtedness to the trust funds. The amounts due to several funds, on June 1908, were as follows: School fund, \$1,563,700; Normal School fund, \$515,700; University fund, \$111,000; and Agricultural College fund, \$60,600.

WISCONSIN — WOLVES

The receipts for 1910 were \$12,105,303.45, and the disbursements, \$11,876,070.70. The valuation of real property was \$1,901,290,225, and of personal, \$577,271,561. The tax rate is \$13.65 per 1,000. The debts of the cities, counties, and minor civil divisions are \$20,069,615. There are 125 National banks, with 135,551 depositors, and \$40,774,994.32 deposits, 358 State banks, with 170,548 depositors, \$34,870,310.75 deposits; there are eight loan and trust companies with 12,617 depositors, and \$2,237,470.89 deposits; and there are 25,507 depositors, with \$6,080,507.08 deposits, in the savings banks.

Religion and Education—The religious denominations of the State are as follows: Roman Catholic, 243,252 male and 251,382 female; Lutheran, 118,703 male and 129,125 female; Methodist, 20,248 male and 35,707 female; Presbyterian, 7,202 male and 12,985 female; Baptist, 7,703 male and 13,899 female; Congregationalists, 8,256 male and 17,907 female. The pupils enrolled in the public schools number 465,306, and the average daily attendance is 309,415. There are 14,659 teachers. The State has 10 universities, colleges and technical schools, with 595 male and 58 female instructors, and 5,727 male and 1,804 female students. The total income is \$1,962,519, which includes tuition fees, productive funds and government funds. The value of the buildings is \$4,110,657, and of the productive funds \$3,091,892. The permanent fund for the support of normal schools, which is derived from the sale of public lands by the State, now amounts to \$1,956,108.66. The normal school system of Wisconsin comprises seven schools at Milwaukee, Oshkosh, Platteville, River Falls, Stevens Point, Superior and Whitewater.

Charities and Corrections—The institutions of the State are a State Hospital, with a normal capacity of 650, Northern Hospital, 650, School for the Deaf, 210, School for the Blind, 120, Industrial School for Boys, 320, State Public School, 130, Home for the Feeble Minded, 1,000, State Tuberculosis Sanatorium, 80, and Workshop for the Blind, 25. The inmates of the various institutions were 4,055. Under the Wisconsin law the acute and chronic insane are separated. For the various State institutions there was expended the sum of \$1,373,490. The State Prison with a new cell ring has at present a normal capacity of 765, and the State Reformatory 296. There were 655 prisoners in the Prison, of whom 426 were working in shops directly paid for by contractors, 41 were on the farm and in building operations productive to the State, 13 were working in the new power plant, 154 were following various occupations in running institutions and keeping up buildings and grounds, and 21 were "losing time entirely by reason of sickness or old age."

Legislation—The Legislature meets biennially. The last session was in 1909, during which a number of laws were enacted regulating the operation of railroads, premiums on insurance policies were prohibited, much legislation was passed in relation to sanitation and pure food; the child labor law was extended to bootblacks and boys and girls selling newspapers on the streets; an eight-hour day was fixed; a law regulating tenement, apartment and lodging houses was passed; provision was made for the care of neglected animals; art commissions in cities of the first-class were established; a statute was enacted that no judgment in a

civil or criminal case may be reversed for any misconduct of the jury, in proper admission of evidence or for error as to any matter of pleading or procedure unless, in the opinion of the Appellate Court, it shall appear, after examination of the entire action or proceeding, that the error affected the substantial rights of the party complaining.

History, 1910—During Oct. 1910, the long contest between John Dietz of Winter, Wis., and the peace officers of Sawyer County was ended by the surrender of Dietz, at his home in the dense woods of Cameron Dan. The trouble arose over some land and the use of the stream of water, which Dietz claimed he owned absolutely. During 1910 and 1911, the investigation into the election of Isaac Stephenson in the United States Senate was continued by both the Senate committee and various State bodies. The charge made is that bribery was resorted to.

Wolves. During 1910 the Government took the first steps in what promises to be a systematic war on wolves. This step was hastened by the enormous losses suffered by stockmen on the Western cattle ranges and the destruction of game on forest reserves, private game preserves, Southern plantations, large farms and in national parks, through the consistent depredations of these animals. The start of the governmental war on wolves during 1910 took the shape of a special investigation by the Biological Survey, acting in cooperation with the Forestry Bureau, to ascertain the best methods of destroying these pests. The two departments, acting in conjunction, have compiled an elaborate report as the result of their investigations, including directions for the best means of trapping, poisoning and hunting wolves and finding the dens of the young. It is hoped to place a copy of this report in the hands of every hunter, trapper, forest ranger, and ranchman. If the directions are rigidly followed, it is believed that the number of wolves will before long be so diminished that their depredations will cease to be a serious menace to the increase of stock and game. The ranchmen have a double incentive in pursuing wolves, now that reasonable means of success are within reach, since, besides protecting their own property in so doing, they can secure from \$4 to \$6 each for prime wolf skins. However, it is not deemed possible to consummate the entire extinction of the species within the near future, and it is only by the most persistent and concerted warfare that the number of wolves can be cut down sufficiently to prevent serious depredations.

In the course of its investigation the Biological Survey found the wolves to be divided into two groups, the smaller coyotes, or prairie wolves of the Western United States, Mexico and Southwestern Canada, comprising several species and sub-species, and the larger gray, black, or timber wolves distributed throughout practically the whole of North America from Florida to the tableland of Mexico and to the Arctic Ocean. These large wolves, commonly called "loafers" or "lobos," include at least half a dozen species or geographic races, comprising the small dark gray or black wolf of Florida and the Southeastern United States, the red wolf of Southern Texas, the brindled

WOMAN SUFFRAGE

wolf of Mexico, the light gray wolf of the central plains region, the dark gray wolf of Eastern Canada, the almost white wolf of Northern Canada and Alaska, and the large black or dusky wolf of the Northwest coast region

The stock killed by wolves consists mainly of cattle. Calves and yearlings are usually selected, but, if these are not available, cows, and even full-grown steers become their prey. The wolves' method of attack is usually from the rear, and the animal assailed is literally eaten alive. Sometimes animals thus attacked escape with huge pieces torn out of their hams, while the wolves go on to catch and kill another. Cattle so bitten rarely survive, and the ranchmen hold that more cattle are killed in this way than are actually eaten by wolves. The total number of cattle killed by wolves during 1910 cannot be accurately determined. It has been estimated, however, that a single family of wolves will destroy about \$3,000 worth of stock annually on a large ranch.

Woman Suffrage. The Woman Suffrage forces, both in the United States and in England, were unusually active in their efforts to gain the franchise during 1910. The campaign in this country was more peaceably waged than abroad, but, none the less, sentiment ran high in all sections of the land. Numerous large "Women's Rights" meetings and rallies were held, street corner campaigns were conducted, special "votes for women" publications were issued, and posters and placards also played a prominent part in the prosecution of this movement by its advocates. All this had its effect. Although the woman suffrage movement was derided in many newspapers, and its leaders systematically ridiculed, its advocates persevered determinedly and, late in the year, the State of Washington was won over to the cause and women admitted to the franchise—thus making a total of five States in this country in which women are to-day permitted to vote. These are as follows: Idaho, Colorado, Utah, Wyoming and Washington. This gives the women suffragists a continuous belt of territory stretching from the western boundaries of Nebraska to the shores of the Pacific. The amendment in Washington by which women were admitted to the vote in that State was passed by a majority of 25,000. This victory came as the result of a hard, concerted fight. For four years, while Washington was a territory, women had the franchise there. When Washington was admitted to statehood, however, that order no longer obtained. Since that time, two unsuccessful attempts were made to pass a women suffrage amendment to the constitution of the State, the first of which, in 1889, was defeated by a majority of 19,386, and the second, in 1898, by a majority of only 9,882. Then came the third and successful attempt in 1910. In order to gain this victory the suffragist forces conducted a political organization, with State, county and local headquarters, and precinct captains. Every voter in the State received campaign literature, while a large number of the voters were personally interviewed. A weekly paper, *Votes for Women*, was published in Seattle, and buttons, posters and pamphlets were distributed broadcast, while in many cities booths were erected on the street corners. In

one of their campaign placards the Washington women suffragists divided their reasons for desiring the vote under eight heads, as follows: (1) Because those who obey the laws should have something to say as to their making, (2) because, those who pay taxes to support the government should be represented in the government, (3) because those who have the homes in charge should be able to aid in the law-making which protects and relates in any way to children and to the home; (4) because it is the most womanly, economical and efficient way of influencing public affairs, (5) because government is a question of the people, for the people, and should be by the people, not by men alone, (6) because it (woman suffrage) has been eminently successful wherever tried both in the United States and in foreign countries; (7) because women themselves want woman suffrage—there being 6,000,000 club women and 6,000,000 other women in the United States who are asking for the ballot; and (8) because it is the only method of government that is moral and just. These represent the essential arguments of woman suffragists in all States. Although succeeding in the State of Washington, the woman suffragists were, during the year 1910 defeated in three other States in which they succeeded in having an amendment which would entitle them to the ballot voted upon. These three States were Oregon, South Dakota and Oklahoma. The woman suffrage leaders excuse these defeats on the ground that in Oregon the amendment would have given the vote to tax-paying women only, while in South Dakota there were local-option complications, and in Oklahoma certain local conditions made success impossible almost from the start.

The effects of extending the franchise to women in this country can be best estimated by the results in Colorado, where women have had full suffrage since 1894. The effect on party politics there has been admittedly slight, but the adherents of woman suffrage claim that it is chiefly to be credited with cultivating intelligent public spirit among women, with enlarging their interests, with developing in many cases public administrative ability of a high order, and of broadening the comradeship between men and women. To-day about 40 per cent of the total vote cast in Colorado is cast by women. Their activity in primaries is very much more limited than at the polls. It appears, too, that political activity among the women is very much more marked in cities and larger towns than in rural districts. At nominating conventions a few women delegates frequently appear, although in this role, as well as in the role of nominees for elective office, women are somewhat less in evidence in Colorado than when equal suffrage was first tried. In the cities, a greater number of women register and vote from the residential districts than from the slum sections. So far as the influence of the women voters on politics and the resultant type of government is concerned, it would seem that party managers have become more diffident about nominating men of notoriously unclean lives or those in any way connected with saloons. Although several women have sat in the Colorado Legislature, no particular preeminence can be claimed for legislation passed since 1894 in the interest of either women or children, and

WOMAN SUFFRAGE — WOODCOCK

on the social evil, too, it is impossible to perceive that the admission of equal suffrage has had any particular effect. On the other hand, in the administration of schools and charities women in increasing numbers have shown capacity as public officials. The effect of the franchise on the economic status of women in Colorado in the last 12 years has been evidently slight, while the effect of suffrage upon the character of the women themselves has also been imperceptible.

The struggle for woman suffrage in England has been unsuccessfully going on for 40 years. Recently it has taken on alarming proportions. The zeal of its most ardent adherents has led them into exhibitions of insult and violence which have been positively unlawful, and which have, in not a few instances, landed the principals in jail. The bill granting the franchises to women, presented by Mr. Shackelton, first passed the House of Commons by a majority of 109, then, within a few minutes, the same House of Commons decided by a majority of 145 that the bill should not become law and referred it to a standing committee. The net result was a very decided set-back to the cause. Mr. Asquith allowed the bill to be brought in and debated because, as he put it, of his "desire to fulfill an extorted pledge" made before the general elections. He, however, took good care that the measure be shelved as a matter of "political tactics."

Despite this, however, the woman suffragists renewed the battle even more strenuously than before. On 18 November, an army of the militant suffragists, who have come to be known as "suffragettes," engaged in a hand-to-hand fight with the London police outside the House of Commons. Their object was to gain access to the building and once again lay their grievances before the Premier. It was the eighth siege of Parliament which the "suffragettes" had conducted in this strenuous manner, and before it was over 119 of them had been placed under arrest. Among this number was Mrs. Pankhurst, the admitted leader of the militant suffrage camp in England. The ages of the women who took part in this demonstration ranged all the way from 17 to 75. With them they carried standards bearing the legends, "Votes for Women," "Deeds not Words," "Thick and Thin when We Begin," "Arise, Go Forth, and Conquer," and such slogans. When the actual encounter occurred the women showed no scruples in beating the police over the heads with the poles on which the flags were mounted. The conflict between the two lasted for several hours. In the course of it the police, although beaten, kicked, bitten, scratched, and in one instance cut with a knife, displayed unusual control, only resorting to violence when some particularly daring piece of vandalism on the part of one of the women compelled them to act. Those who were arrested positively gloried in their imprisonment and referred to it as "martyrdom for the cause."

Only a few days later, a still more serious outbreak of these London suffragettes occurred. This began, on 22 November, with an assault on Premier Asquith, and rioting of the most flagrant sort continued throughout the night. As soon as they were dispersed at one point, the women who escaped arrest would gather at another and renew the battle. The Asquith

residence in Downing street was stormed, stones and metal weights being thrown at the house, and all the lower windows being broken in the course of the raid. The houses of Sir Edward Grey, the Foreign Secretary, of Lewis Harcourt, Secretary of State for the Colonies, and of Winston Spencer Churchill, the Home Secretary, were also stormed by the suffragettes and the windows smashed. Augustus Birrell, the veteran chief secretary for Ireland, was the victim of a most serious and vicious assault. The aged statesman was confined to his bed for several days as a result of injuries from blows and kicks delivered by the women assailants. From this night of vandalism, 156 women and two men found their way into the police court. This is perhaps a rather exaggerated, but, in point of style, at least, typical instance of the sort of campaign waged by the English woman suffragists throughout 1910.

Some of the women suffrage leaders from England visited this country in 1910 and made extended lecture tours. Prominent among these were Mrs. Pankhurst, Lady Cook and Lady Snowden. Elaborate receptions were prepared for all these ladies by the women suffrage organizations here, and their lectures were all largely attended. Their efforts to stir the women of this country up to a fighting pitch in their struggle for the ballot were, however, not strikingly successful. Street parades, speeches and militant equal suffrage rallies were for the most part the most sensational extremes of the American campaign. None the less, the demonstrations in the United States were sufficiently strenuous and militant to bring down a vast amount of ridicule on the cause from a part of the press. That woman's desire for the ballot is by no means universal, either in this country or in England, was also evidenced by strong anti-woman suffrage societies in both countries, composed entirely of women. Owing to their more quiet and dignified methods, the latter did not excite nearly so much popular attention as did the suffrage forces, but they were none the less hard at work all the while, doing everything in their power to check the spread of the movement.

Taking the five States in the United States where women have been given the franchise as a basis of judgment, it would appear that the adoption of woman suffrage has, on the one hand, done no particular harm, and, on the other, has accomplished no particular good. The subject is essentially an extremely partisan one, and much has been written and said latterly both in condemnation and vindication.

Women, Farmers' Institutes for. See FARMERS' INSTITUTES FOR WOMEN.

Woodcock, Charles Edward, third P. E. bishop of Kentucky and 225th in succession in the American episcopate: b. New Britain, Conn., 12 Jan 1854. He was prepared for college at public and private schools in Plainville and Waterbury, Conn., and by private tutor, and was graduated at Berkeley Divinity School, Middletown, Conn., B. D. 1882 and was given honorary D. D. by Hobart College in 1904 and by the University of the South in 1905. He was ordered deacon in 1882, and ordained priest in 1883 at the hands of Bishop Williams, of Connecticut. He was assistant to the rector of Grace Church, Baltimore, Md., 1882-84; rector of Church of the Ascension, New Haven,

Conn., 1884-88; of Christ Church, Ansonia, Conn., 1888-1900; and of St John's Church, Detroit, Mich., 1900-05. On 16 Nov. 1904, he was elected the third bishop of Kentucky, and he was consecrated 25 January in his own church in Detroit. He was a member of the standing committee of the diocese of Michigan and represented the diocese in the General Convention of 1904, as he had the diocese of Connecticut in 1895 and 1898. He succeeded the Rt. Rev Thomas Underwood Dudley, D.D., LL.D., D.C.L., who had served the diocese as bishop from 27 Jan 1875, up to the time of his death, 22 Jan. 1904, a period of 29 years.

Wood, Leonard, American major-general, U. S. A. b Winchester, N. H., 9 Oct 1860. He attended school at Pierce Academy and took the medical course at Harvard, receiving its degree of M.D. in 1884, and its honorary degree of LL.D. in 1899. He was appointed from Massachusetts assistant surgeon in the United States army, 5 Jan. 1886, and it was while serving in this capacity, in a campaign against the Apache Indians under Captain Lawton, that he was afterwards awarded a congressional medal of honor "for distinguished conduct." On 8 May 1898, he was chosen commanding colonel of the 1st United States Volunteer Cavalry, the famous "Rough Riders," and exactly two months later was made brigadier-general for services at Las Guasimas and San Juan Hill. Other promotions followed in rapid succession, until, 8 Aug 1903, he was made major-general in the United States army. He was military governor of Cuba from 12 Dec 1899 until the transfer of the government of Cuba to the Cuban Republic, 20 May 1902. In March 1903 he was sent to the Philippine Islands, where he was, in succession, governor of Moro Province, commander of the Philippines Division, and later, commander of the Department of the East. He was appointed chief of staff, U. S. A., 15 Dec 1909.

Wool. The year 1910 was an unfavorable one for wool growers and wool manufacturers alike throughout the country, due to the hostile agitation over the tariff, natural conditions which affected sheep raising, and high prices which restricted the market, according to the 22d annual wool review issued by the National Association of Wool Manufacturers. The review is based on the number of sheep fit for shearing 1 April 1910, the estimate placing the number of sheep in the country at 41,999,500, a decrease of 293,705 from 1901. An actual increase was shown in the number of sheep in New England, the Eastern and Middle Western States, but a decrease in the Far Western and Southern group of States. The review says in part: "The year opened with probably 40,000,000 pounds, or 40 per cent more wool, including that in bond, carried over than was the case in the beginning of 1909. The wool market was quiet in January, with prices fairly firm. The market sagged in February, and the first quarter of the year closed with grave disappointment. The heavyweight season was a failure and prices remained in favor of the buyer. Through the Spring months the depression continued. There were somewhat larger sales in April, because many holders wearied of carrying their wool. American purchases in Sydney and Victoria showed a great falling off, while during September the central

feature of the market was the sale of moderate quantities of the 1910 domestic clip for shipment to England. The exports were the direct result of persistent political agitation for a reopening of the tariff, particularly of schedule K. The year 1910 was one of distinct prosperity in European manufacturing and of a brisk wool and woollen trade all over the world, except in the United States or in those markets directly affected by the American situation. The low prices on the domestic wool market and the idle machinery in American mills simply reflected the demand of hostile interests that the new Aldrich-Payne tariff should be overthrown as soon as it had been enacted, before there had been any fair chance for the actual, honest test of the law in operation. The increased demand for carded wool goods has not grown to the extent that was hoped for. Still, the manufacturers of these goods have experienced a better fate of late, and some of this class of mills have been employed to their full capacity. The terrible winter was followed by a summer's drought, and altogether, with natural and political conditions warring against them, the wool growers have good cause to remember 1910 as a year of sinister experience. The total domestic wool clip, not including pulled wool, is estimated at 281,362,750 pounds, a decrease of nearly 6,000,000 pounds as compared with last year. The scoured equivalent is 112,605,813 pounds, a decrease of less than 1,000,000 pounds as compared with last year. The pulled wool in the grease is estimated for this year at 40,000,000 pounds, equivalent to 29,200,000 pounds of scoured wool. The total value of the wool product of the United States for the year, estimated on the scoured price in Boston, the chief wool market of the world, 1 October, was \$72,489,838. In 1909, the estimated value was \$88,829,746.

Worcester Conference. Liberia, the negro-populated and governed colony of West Africa, and its relation with the United States, were considered at the conference on the Near East and Africa, held in Oct 1910, at Clark University. "Dynamic Factors in the Liberian Situation," were given in an address by George W. Ellis, for eight years secretary of the American Legation of Monrovia, Liberia. "The Contribution of the Negro to Human Civilization" was discussed by Prof. Alexander F. Chamberlain, of Clark University. Emmet J. Scott, of Tuskegee Institute, Ala., who was a member of the commission sent by the United States government to investigate conditions in Liberia, recited some of the observations in that commission in an address on "The United States and Liberia."

Worcester Elwood, American clergyman: b Masillon, Ohio, in 1863. He was graduated from Columbia University A.B. 1886, A.M. 1889, and from the University of Leipzig A.M. and Ph.D. in 1889, receiving the honorary degrees of STD from Hobart College in 1897, and that of D.D. from the University of Pennsylvania in 1898. He was ordered deacon in the Protestant Episcopal Church in 1890; ordained to the priesthood in 1891; was chaplain and professor of philosophy and psychology at Lehigh University 1890-96, acting rector of St John's Church, Dresden, Germany, 1894-95, and rector of St. Stephen's Church, Philadelphia, Pa., 1896-1904. In the latter year he was

chosen rector of Emmanuel Church, Boston, Mass. With the help of several prominent laymen, Doctor Worcester founded what is known as the Emmanuel Movement, basing his teachings on the theory of John Locke, the English Philosopher, who held that "The soul does not think before the senses have furnished it with the ideas to think on," meaning that the mind can only act upon what is given to it from without, furnishing nothing original from itself. This philosophy of the power of mind over matter Doctor Worcester combined with the religious teachings of the church, and the movement proved successful, gaining many followers who found in it the very help claimed to be offered by the teachings of Christian Science without destroying any of the orthodox teachings of Christianity. He is the author of 'Religious Opinions of John Locke' (1889), 'The Book of Genesis in the Light of Modern Knowledge' (1901); 'Religion and Medicine' (1907); and 'The Living Word' (1908).

World, Map of the. See MAPS

World's Citizenship Conference. See CITIZENSHIP CONFERENCE, WORLD'S

World's Missionary Conference. See MISSIONARY CONFERENCE, WORLD'S

World's Student Movement. See STUDENT MOVEMENT, WORLD'S.

Wright, Orville and Wilbur. American inventors and aeronauts. ORVILLE was born, 19 Aug 1871, in Dayton, Ohio, and WILBUR, 16 April 1867, near Millville, Ind. As soon as they were old enough to assist in the support of the family, they went to work for an uncle in his bakery shop near Dune Park, Ind. While there, they heard about the aeronautic experiments of Herring and Chanute, of Chicago, and quietly gathered all the information they could about the new science. With a natural aptitude for mechanics, though lacking a thorough scientific training, they became students of engineering problems. In a remarkable degree they supplemented each other's efforts, operating a bicycle repair shop in Dayton and securing small profits which they could apply to their experiments in aviation. They worked, at first, building gliders for their own amusement, and developing their ideas for a flying-machine. They did not wish to imperil their business by being thought visionary cranks, and being by nature self-confident men, self-centered and self-possessed, they worked in secret. Their work at that time was painstaking and patient; and, as they progressed, they revised their ideas of a practicable aeroplane. The magnitude of their plans grew upon them, the difficulties became clearer, and their purpose to solve the problem of flight became more fixed and serious. They began to realize that they were doing a great scientific work which had baffled the best minds. They accumulated a scientific library, but had to dismiss as useless the discussions of aerodynamics which they had read, except those of Octave Chanute, the Chicago inventor and engineer. Conferring with him, they profited by the stimulus they derived from his knowledge, and soon began to make amazing progress, until finally they produced a glider with a motor, which flew. The first successful man-flight in history was that of Wilbur Wright, 17 Dec 1903, in the biplane "Kitty Hawk," a distance of 852 feet in 59 seconds.

Early in their experiments they had planned to give the results, if successful, freely to the world, but now realizing that great financial benefits were to be derived from the invention, they determined to keep them for themselves. It took them two years (1904-1905) to obtain entire control over their machine. They doubled their precautions against publicity; but the news of their success was carried to France, and it awakened there so great an interest that a syndicate was formed to acquire their machines. Their sister, Katharine, who had saved her earnings as a school teacher, supplied the funds needed to build an aeroplane suitable to show to the French commission, which was delighted with the exhibition, and immediately secured an option to buy it. The publication of sketches of the machine in various newspapers at this time resulted in the manufacture of similar aeroplanes in France even before the syndicate from that country returned home, and they, losing interest in the Wrights, forfeited their option.

The setback to the Wright Brothers was only temporary, however. They perceived, as soon as the initial furor over Farman, the Delagranges and the others had died out that they would soon again have a chance to interest investors. The foreign-built aeroplanes could not compare with theirs in speed and ability to soar. Still, capital, even that of the government, was slim, until Charles R. Flint, the New York banker, took advantage of his opportunity to promote the interests of the Wrights, both here and in Europe, and after that their success was assured. For their record of achievements see AVIATION, HISTORY OF.

Wyoming. A State belonging to the Mountain division of the United States, with an area of 97,890 square miles, of which 315 square miles is water. The capital is Cheyenne. The population of Wyoming is 145,965, an increase of 53,434 or 57.7 per cent in the past 10 years. The population per square mile is 1.5. Wyoming ranks 49th in population.

Agriculture — Wyoming is arid, and, without the aid of irrigation, unsuitable for agricultural pursuits. Extensive irrigation works are being undertaken on the Shoshone and the North Platte rivers, \$3,250,000 having been allotted for the purpose. Many irrigation and development companies are also at work. Such crops as are grown consist of vegetables, cereals and other fruits. The acreage, production and value of important farm crops in Wyoming in 1910 are as follows: Corn, acreage, 6,000 acres; yield per acre, 10 bushels; production, 60,000 bushels; total farm value, \$40,000. Winter wheat, acreage, 42,000 acres; yield per acre, 25 bushels; production, 1,050,000 bushels; total farm value, \$998,000. Spring wheat, acreage, 65,000; yield per acre, 25 bushels; production, 1,625,000 bushels; total farm value, \$1,544,000. Oats, acreage, 130,000 acres; yield per acre, 32 bushels; production, 4,160,000 bushels; total farm value, \$2,080,000. Barley, acreage, 4,000 acres; yield per acre, 30 bushels; production, 120,000 bushels; total farm value, \$80,000. Rye, acreage, 1,000 acres; yield per acre, 18.5 bushels; production, 18,000 bushels; total farm value, \$54,000. Potatoes, acreage, 11,000 acres; yield per acre, 100 bushels; production, 1,100,000 bushels; total farm value, \$902,000.

WYOMING—X-RAYS

Mining and Manufactures—In 1909, of the total value of products of manufactures, 64 per cent was confined to three industries—railroad repair shops, \$2,337,000, lumber and timber products, \$751,000, and flour and grist mill products, \$746,000. There were 2,811 wage-earners reported for the entire State, of whom 1,690, or 60 per cent, were employed in the nine carshops, the value of whose products is given above. The value of products in 1909 was \$5,948,000, compared with \$3,523,000 in 1904, an increase of \$2,425,000, or 69 per cent. The average per establishment was approximately \$22,000 in 1909, compared with \$21,000 in 1904. The salaries and wages in 1909 amounted to \$2,346,000, compared with \$1,467,000 in 1904, an increase of \$879,000, or 60 per cent. The prosperity of Wyoming is largely dependent on its mineral resources. The output of coal in 1908 amounted to 5,489,902 short tons, valued at \$8,868,157. In the same year, the production of copper was 2,416,197 pounds, value, \$318,938. Gold was produced in 1908 to the amount of 368 fine ounces, value, \$7,600; and silver to the amount of 3,500 fine ounces, value, \$1,900. The quarries yield limestone and sandstone, besides gypsum, from which plaster of Paris and other plasters are made. The total mineral output in 1908 was valued at \$9,453,341.

Government—The Governor of the State is J. M. Carey with a salary of \$2,500. The Secretary of State is F. L. Hoax; Treasurer, J. L. Bairs; Auditor, R. B. Forsythe; Superintendent of Education, Rose Bird, all Democrats except Bird and Forsythe. The Legislature consists of a Senate of 27 members, elected for four years (about one-half retiring every two years), and a House of Representatives of 56 members elected for two years. The suffrage extends to all citizens, male and female, who can read, and who are registered as voters and have resided in the State one year and in the county 60 days next preceding the election.

Financial—The total assessed valuation of Wyoming in 1910 was \$186,560,916. The bonded debt was \$120,000. The receipts for the two years ending 30 Sept 1910, was \$2,457,617. The disbursements for the same period were \$2,130,389, leaving a balance of \$327,228.

Religion and Education—The religious bodies with the most numerous membership are Catholic, Mormon, Protestant Episcopal, Methodist and Presbyterian. In 1910 the common

public schools had 24,584 pupils and 1,109 teachers. The 18 public high schools had 50 teachers and 1,761 pupils. Teachers are trained in the normal school which is carried on in connection with the University of Wyoming, at Laramie. This university was founded in 1887 and has 30 professors and 224 students. Besides the normal school, it includes an agricultural college, a school of mines, a college of mechanical engineering, a school of commerce and a school of music.

Charities and Corrections—The State has a penitentiary and other penal or reform institutions. Its charitable institutions are numerous, comprising a poor asylum, a poor farm, a soldiers' and sailors' home, a miners' hospital and two other hospitals, besides two for the insane, and an asylum for the deaf, dumb and blind. Boards of county commissioners have supervision of the poor and may either contract for their support or appoint agents to provide for them. Ninety days' residence immediately before application entitles to county support. It is a misdemeanor to bring into a county a pauper who has a residence elsewhere. The county commissioners may provide for a work-house.

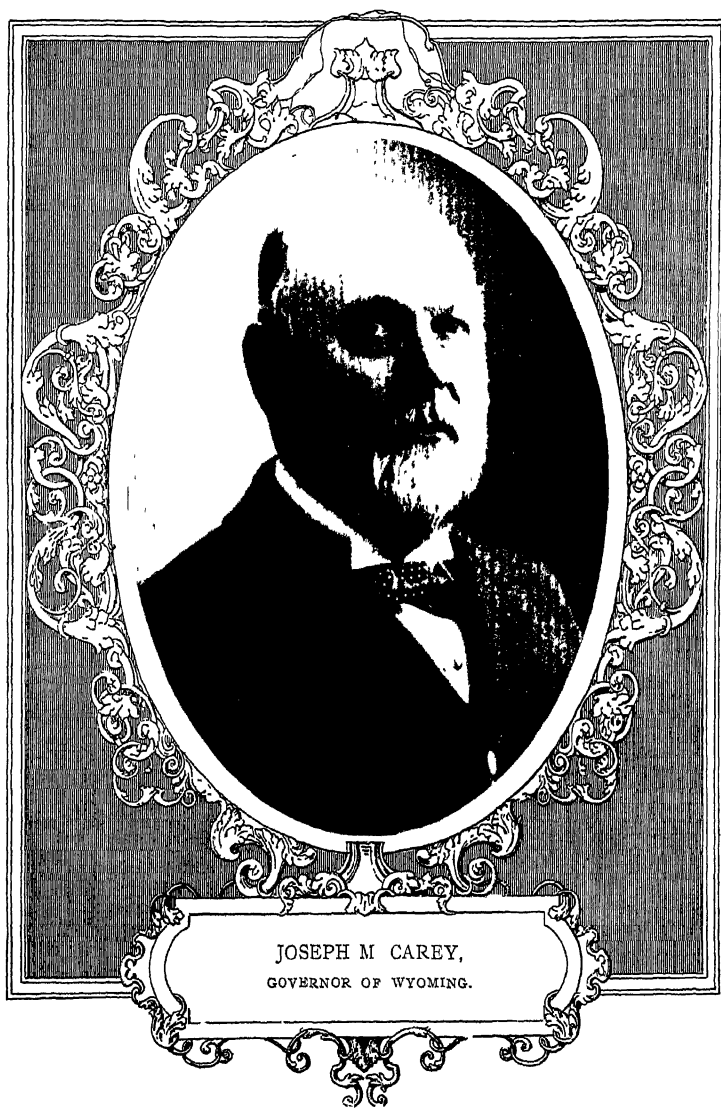
Legislation—There was no regular legislative session in Wyoming in 1910. The grant of liquor licenses outside of cities and towns was prohibited in 1909, and the amount of the license was increased from \$300 to \$1,000. A day's work in mines and smelters was fixed at eight hours. A corrupt practices act was passed. Commissioners were appointed to deal with contagious diseases among sheep. The office of commissioner of taxation was established. He is to be an expert in matters of taxation, and is to have general supervision over the administration of all assessment and tax laws. Indefinite terms of sentence and the parole of prisoners were provided for. Persons divorced may not remarry, except each other, for a period of one year, violation of this act is a misdemeanor. The desertion by a man of his wife and children, without making provisions for their care, was made a felony. He may, at any time, however, before sentence, give bond to make proper provision, and sentence is then suspended. The salaries of public officers were subjected to garnishee. Provision was made for the examination and registration of trained nurses.

X-RAYS. Much important work has been accomplished of late years by means of the X-Rays. Not only have the phenomena themselves been carefully studied, but they have been tried in various illnesses, such as cancer, with varying results. In some cases, the cancerous growth has, under their influence, sloughed off and fallen away; but relapses have occurred in the majority of cases, and the treatment cannot be relied upon as a permanent means of cure. On the other hand, the actual danger of the rays, to the operator, has been discovered. Dr. Mihran K. Kassabian lately died from cancer induced by the very rays with which he was treating his patients. Dr. Ernest Wilson, for 12 years radiographer for the London Hospital, also lost several of his fingers, as a result of the rays, and underwent seven operations before he was forced to give up his

scientific career. As a result of these and many similar accidents, operators now work behind leaden screens, to protect themselves from the destructive rays. It is well known that Professor Curie severely burned his breast by carrying in his pocket a glass tube, containing radium, on his visit to London, when he first exhibited it there. All radio-active substances possess this destructive property, to some extent.

One improvement has lately been suggested by Doctor Cook, of New York, in the use of the rays; and that is the substitution of the intermittent for the continuous current. Doctor Cook contends that this removes all danger to the patient, and has cited some interesting cases in support of his contention. Further investigations will doubtless establish the correctness or error of his views.

The X-Rays have been employed, of late,



to study the stomach and intestinal tract as a whole, during the processes of digestion (q.v.); and by this means much valuable information has been acquired concerning the processes of digestion, and the passage of food through the intestinal tract. Dr W B Cannon, of Harvard Medical School, originated this method, which has since become widely known and utilized. Only recently, moving pictures have been taken showing, by means of X-Rays, the movement of the food in the intestines.

As to the nature of the X-Rays, they remain to a certain extent a mystery, in spite of all the work that has been put upon the problem. Experiments have shown that they are closely akin to the *gamma* rays from radium (q.v.). Prof Robert Kennedy Duncan, summing-up the present-day knowledge of the X-Rays, says, in his 'New Knowledge' (p 110)

"In our study of the properties of corpuscles, we learned that whenever corpuscles of a Crookes' tube struck against the metal plate or the walls of the glass containing vessel, X-Rays were developed; and that, in fact, an ordinary X-Ray bulb was nothing but a tube in which corpuscles were generated. If the *beta* rays from radium are in solid truth corpuscles. . . it is natural to expect that they should generate X-Rays in their back-stroke as they left the radium, and consequently it should be no matter of surprise to find in the *gamma* rays nothing but X-Rays as a natural accompaniment to the corpuscles. Whether the *gamma* rays are, therefore, in their nature nothing but X-Rays, it is at this time not positively certain. Of course, the identity of the *gamma* rays with X-Rays does not tell us what the *gamma* rays are in themselves, unless we know the nature of the X-Rays, and in the X-Rays we have still, more

or less, a mystery. X is an unknown quantity. It is probable that they are not a form of matter, that is, they are not particles at all, but more in the nature of pulses or waves in the surrounding ether, set up by the impact of the corpuscles or *beta* rays. . . . It is probable that the X-Rays are due to etherial vibration, not to material particles, and that the *gamma* rays from radium are X-Rays."

A method of making X-Ray photographs of the interior of the human body in a small fraction of a second, has recently been devised. The invention is of great medical importance. When we remember that the blood vessels and many other organs are set into vibration by the pulsations of the heart, it becomes evident that it has hitherto been impossible to obtain sharp X-Ray photographs of the chest or even of the abdomen. In the heart itself, the amplitude of this oscillation is about two-fifths of an inch; in other organs the amplitude decreases in proportion to the distance from the heart. Dessauer recently succeeded in obtaining good X-Ray photographs with an exposure of one-hundredth of a second. This was accomplished by energizing the Roentgen ray tube with an impulsive current of this duration. The device by which the primary current of the induction coil is interrupted consists of a wire, of carefully calculated dimensions, covered with a black coating of some hygroscopic material, such as plaster or clay, and inserted in the primary circuit. This wire is heated by the current to its fusing point. In this way water-vapor is produced, the pressure of which very soon causes an explosion and breaks the wire. The self-induction spark is extinguished by the fine particles of dust arising from the explosion. By this method it is possible to photograph the separate phases of the movement of the heart.

YACHT, Non-Magnetic. See CARNEGIE YACHT.

Young, Eliza Flagg. American educator: b Buffalo, N Y., 15 June 1845. She attended the public schools of Buffalo and Chicago, and was graduated from the Chicago High School and from the Chicago Normal School. She engaged in teaching and took up her duties as teacher of the first grade in the Foster School, Chicago. In 1868 she was married to William Young who died shortly after their marriage, and Mrs. Young thereafter devoted herself to educational work, holding the positions of district superintendent of schools, Chicago, 1887-99; professor of education at the University of Chicago, 1899-1905; principal of the Chicago Normal School, 1905-09; and was elected Superintendent of Schools of Chicago 29 July 1909, to succeed Edwin A. Cooley, resigned. In this position she held the administrative authority over municipal investments amounting to \$50,000,000, and commanded a salary of \$10,000 a year, the highest ever paid a woman educator. She was elected a member of the Illinois State Board of Education in 1888; president of the Illinois State Teachers' Association in 1910, and founded the Eliza F. Young Club for the women principals of the Chicago elementary schools. She was the editor of the *Educational Bi-Monthly*, 1906-09, and is the author of 'Isolation in the School' (1901); 'Ethics in the

School' (1902); 'Some Types of Modern Educational Theory' (1902); and various monographs. In 1910 she was elected president of the National Educational Society, defeating Z. X. Snyder, president of the Colorado State Normal School and the regular organization candidate, by a vote of 617 to 376, and was the first woman to preside over the affairs of the association.

Young, Lafayette, United States Senator: b in Monroe County, Iowa, in May 1848. When 13 years of age, he was thrown on his own resources, and worked in various newspaper offices in Iowa. In 1868 was employed in the job department of the St Louis *Despatch*, and in 1870 he returned to Iowa and founded the *Atlantic Telegraph*, at Atlantic, Iowa, which he published 19 years. He was elected State Senator, 1873-77 and 1885-89, and in March 1890 he purchased the *Des Moines Capital*, becoming its editor and publisher. Mr. Young was permanent chairman of two Republican State conventions, was delegate-at-large to the Republican National Convention in 1890 and 1898, and placed the name of Theodore Roosevelt before the Republican National Convention at Philadelphia in 1900. He was a war correspondent with General Shafter's army in Cuba in 1898, and a member of Secretary Wm. H. Taft's party to the Philippines in 1905. In 1908, he was appointed elector-at-large during the presidential campaign, and, 12 Nov. 1910, was

Y. M. C. A.—YOUNG PEOPLE'S MISSIONARY MOVEMENT

chosen by Gov. B. F. Carroll, of Iowa, to occupy the seat in the United States Senate made vacant by the death of Senator J. P. Dolliver. He was sworn in at the opening of the congressional session in Dec 1910.

Young Men's Christian Association. An organization made up principally of Christian young men, mutually organized to advance the spiritual, physical, intellectual and social condition of its membership first started by George Williams, of London, in June 1844. From the eastern continent to the western it spread and is now located in nearly every country on the face of the earth, including 24 countries in Europe, 10 countries in America, 5 in Africa and 3 in Australasia, with a membership of nearly 1,000,000. At the beginning of 1911 the Association had 2,017 centres in North America; 700 buildings valued at over \$70,000,000; employing a force of 2,927 men. During 1910, buildings were secured on the wholesale plan. Toronto, Pittsburg, Cleveland and Chicago, by the rapid campaign method, provided for four each; Montreal was erecting three and Winnipeg two buildings. In five days Vancouver, British Columbia pledged \$350,000 for two buildings, and then raised a fund for the Young Women's Christian Association—after the example of several other local Associations. On 19 December, the Louisville Association completed a fund of \$395,000 for the purpose of erecting three buildings. In the "clean-up" campaign in Ohio over \$1,000,000 was raised. San Juan and Porto Rico, by this plan obtained \$50,000. The most notable achievement in the campaign was the \$2,000,000 fund providing for over fifty buildings in foreign cities—a fund started by President Taft, four-fifths of which was pledged up to Jan. 1911. Other statistics covering the year 1910 are given as follows. Positions filled, 32,618; young men living in association dormitories, 25,071; young men directed to wholesome homes, 57,891; Railroad Association beds provided, 2,275,067 times; sailors, naval branch furnished 83,000 beds, North American secretaries in the foreign field, 100, receiving \$200,000 a year; 50 new secretaries asked and secured with the \$2,000,000 fund for 50 buildings; men in Bible classes, 100,000; attendance at religious meetings, estimated at 4,000,000; raised and expended by State, Provincial, County and International committees, for the work of supervision and extension, nearly one million dollars, local association expenditures, \$7,163,000; boys in their teens directed in study, work and play, 200,000; meetings for men attended during year by 3,800,000; members, over 500,000; serving on organized committee, 66,723, associations, 2,017; board of directors, 24,000, members of State and Provincial committees, 1,032; members of International committee, 63, attended meetings for men, 3,800,000; in physical training, 300,000; gymnasiums, 577; students' associations, 658 branches; members of student bodies, 50,417. The 37th International Convention of North America was held at Toronto, Canada, 28-31 Oct 1910.

It was decided, after a two hours debate, that there shall be no change in the present evangelical basis of the association, which stipulates that only members of evangelical churches shall have a vote in the association's government.

C. R. Townsend, industrial secretary, urged

a larger community of service to the foreigners coming annually to the United States, and condemned the liquor traffic as an enemy of righteous living and the disturber of working conditions.

Young People's Missionary Movement.

An association organized to disseminate missionary information and awaken missionary enthusiasm among the Christian young people of the United States and Canada. Officially inaugurated in 1902, the Movement now reports about 200,000 young people actively engaged in the study of missions under its supervision. The Movement prepares an extensive literature for use by the mission boards of the various denominations, cooperates with editors of Sunday School literature, in the preparation of missionary material and conducts institutes at summer assemblies and in cities for the training of teachers of classes in mission study. The report of its managers to the first international convention of the Movement, held at Pittsburg in 1908, stated: "One of the peculiarities of the Young People's Missionary Movement is, that, while it is undenominational in organization and management, everything which it has or does is used denominationally. Having no membership nor local constituency nor contact with organizations in local churches, it stands in the strategic position of administering to the needs of all. It thus unites for common purpose the leaders of all the missionary organizations on the Continent. By this method of administration, it is producing for these mission boards all material at an expense very little above what it would cost one board to carry on such far reaching plans for itself. It secures the experts on missionary problems from each of the denominations, and through them makes available to every denomination the best things missionary. It is therefore auxiliary to all missionary activity, but takes the place of no other organization now in existence."

In 1890, the American Baptist Missionary Union inaugurated a special missionary propaganda among the young people of its own denomination, employing Miss Ella D. MacLaurin as one of the first workers in this field. In 1893, the Board of Foreign Missions of the Reformed Church in America also gave special emphasis to young people's work, and Rev. A. DeWitt Mason, one of the secretaries of that board, began to devote part of his time to the development of this phase of its activities. In this year, 1893, the Board of Home Missions of the Presbyterian Church put the same idea into operation and appointed Rev. Thornton B. Penfield to supervise it. In 1894, this denomination appointed Mr. W. Henry Grant to engage in the same kind of work in the interests of Foreign Missions. In 1895, the Young Peoples' Forward Movement was organized in the Canadian Methodist Church, under the leadership of Dr. F. C. Stephenson, and a Student Missionary Campaign was developed. In 1900, the Methodist Episcopal church organized a special department for missionary work among young people, appointing Mr. S. Earl Taylor its secretary.

In September 1901, a meeting was held in the Dutch Reformed Church Building in New York City, of representatives of the various boards who had undertaken this work. The result of this meeting was a general conference,

YOUNG WOMEN'S CHRISTIAN ASSOCIATION — ZIONISM

held in the Presbyterian Building at New York in December of the same year, for representatives of a large number of the missionary boards. A committee was appointed which met in Toronto on the occasion of the student Volunteer Convention held there in February 1902. The committee decided to call a conference of missionary leaders at Silver Bay, Lake George, during the following summer. At this conference, the Young People's Missionary Movement was formally organized, 18 July 1902. An office was opened in New York in Jan. 1903. In April 1907, the Young People's Missionary Movement of the United States and Canada was incorporated by special charter from the Legislature of the State of New York.

Coincident with the direct influence of the missionary boards, that of the Student Volunteer Movement must be recognized as forming an important factor in the development of this more general movement. College students who had volunteered their services for the foreign field were scattered over the country among the various denominations, and their enthusiasm not only spread to other young people, but throughout the ranks of the older church people.

The work of the Movement is under the direction of an International Board of Managers. The seven Canadian members of this board constitute the Canadian Advisory Council. Under the Board of Managers, the Field Department organizes and conducts the summer conference of the Movement, with the exception of those connected with Sunday School work, and assists in the conduct of the city institutes, the Editorial Department supervises the editing of the textbooks and other literature, the Sunday School Department keeps in touch with the Sunday School editors, leaders and organizations, and assists in the preparation of missionary material for Sunday School use, conducts a summer conference on this subject, assists in institutes held for the same purpose and has a part in other Sunday School conferences and conventions. The Publication and Office Department supervises the manufacture of books and pamphlets, collects, manufactures and distributes pictorial material for use by the various denominational boards, and manages the office organization and work, the Systematic Giving Department promotes a campaign for proportionate and systematic contributions to missionary work.

During the first year of the Movement, about 17,000 persons were enrolled in mission study classes, the second year about 22,000, the third about 50,000; the fourth over 80,000, the fifth nearly 100,000. In the year 1907, 143,592 textbooks were sold, 22,500 volumes in libraries, 12,881 maps and charts, 17,155 pamphlets. The textbooks issued are used in England, Scotland, South Africa, New Zealand and other countries.

Mr. Harry Wade Hicks is the general secretary of the Movement. During the season of 1910, Summer conferences were held at Asheville, N. C., Lake Geneva, Wis., Whitby, Ont., Knowlton, P. Q., Silver Bay, N. Y., and Rocky Mountain Cascade, Colo.

Young Women's Christian Association.

An organization of Christian young women, of interdenominational scope, for the advancement of spiritual, mental, social, physical and economic conditions of its membership, started in England in 1855 by Lady Kinnaird. The National Board of Young Women's Christian Association was organized in 1906, to unite in one body the Young Women's Christian Associations of the United States, to establish, develop and unify such associations, and to become a factor in the work of the World's Young Women's Christian Association. In 1909, the National Association included 795 local associations—600 in colleges and schools, and 195 located in industrial centres, villages, towns and cities. There are 30 resident members of the National Board, and each of the State and Territorial committees are entitled to one representative. National secretaries and special workers number 23, and a staff of 27 is required for official work. A national training school, 8 preliminary training centres, efficient employment departments, and living accommodations are provided for young women in local branches. The World's Young Women's Christian Association, founded in 1894, has an affiliation of 17 national associations, including United States, Great Britain, Germany, France, Italy, Holland, Finland, Portugal, Sweden, Canada, Denmark, Hungary, China, Japan, Australasia, South Africa and India. The headquarters of the executive committee is located in London and composed of residents of that city. The fourth world's conference was held in Berlin, Germany, in 1910.

ZANZIBAR. See BRITISH EAST AFRICA.
Zinc. See METALS.

Zionism. The name given to the Jewish Palestine colonization movement. The persecutions of Jews in Russia, in 1907, gave great impetus to the movement, together with persecutions in other countries. The death of Theodor Herzl, its great leader, in 1904, was a severe blow, from which the movement did not recover for several years. The Zionist attempt to influence Russian elections met with a rebuff during 1904, and the party contentions in Austria over Zionism weakened the movement in that country. The publication of the denunciatory letter of Jacob H. Schiff, of New York, declared his opinion that those who advocated Zionism could not at the same time

be loyal citizens of the United States. A country home of 250 acres, located at Kiryath Sefer, was substituted for the plan for a home at Jerusalem for the care of orphans, owing to the refusal of the Anglo-Jewish Association to appropriate the balance of its Kishinev fund for this purpose, as requested by the Zionist Actions Committee. The Sultan of Turkey, on 6 Dec. 1907, gave an interview to Herr David Wolfson, president of the Zionist Actions Committee, regarding concessions to Jews in Palestine. In 1908, the Olive Tree Society, the Palestine Land Development Company and the Palestine Bureau were some of the new undertakings. President Wolfson also made several diplomatic journeys in behalf of the movement. He declared that his

audience with the Sultan of Turkey was satisfactory, and that he was favorable to the movement. His visit to Russia was mainly to secure favorable consideration by the government for the Zionist movement. At the annual conference of the Federation of American Zionists, held at Atlantic City in 1908, it was determined to prosecute a more thorough and better organized campaign of propaganda. The movement in the past three years has been steadily advancing, mainly notable for the establishment of a National Fund and for Palestine development. In 1909, at the Palestinian Triennial Conference at Odessa there were 600 delegates present. On 31 January and 1 February of the same year, the English Zionist Federation met at Sheffield and reelected Doctor Gaster president Leopold J. Greenberg, proprietor of the London *Jewish Chronicle*, was elected vice-president. Oxford, Cambridge and London organized university Zionist societies in 1909. The Anti-Semitic press in Russia asserted that the Zionists were unqualifiedly in favor of Palestine independence, and thereby stirred up turmoil. The Russian government turned over the supervision of the Zionists to the non-orthodox religious sects department.

Zionites. See CHRISTIAN CATHOLIC CHURCH.

Zoology. The science of zoology, of the life and habits of the animal world, is receiving more and more detailed investigation at the hands of scientific men, and, whereas zoology in its initial stages consisted of little more than classification and a study of the distribution of animals on our globe, the present science descends to the utmost detail of structure, function and habit. The work of classification once completed, the groups began to be studied in detail, and to-day it may almost be said that the science is complete, so far as our knowledge enables us to go. New specimens are occasionally being discovered, however, which require classification and examination; and, within the past few years, several interesting specimens of this character have been discovered. Thus, Colonel Roosevelt secured a specimen of a new kind of otocyon, on his recent trip to Africa, to which the name of *vergatus* has been given. It is a small carnivorous animal, closely resembling the fox, and was first exhibited at the Smithsonian Institution—under whose auspices the African trip was made. The new animal closely resembles other members of the same species, the skull of the animal resembling that of the gray fox.

Dr. John Haseman also discovered what may be considered a link between the salamander and the fish, on his South American trip last year. The specimen was secured at the junction of the Rio Negro and Amazon rivers, and somewhat resembles a fish with legs. Professor Holland, in speaking of this addition to zoological knowledge, said:

"The specimen received is a scaleless animal which is blind, has a dorsal cartilaginous cord instead of a true skeleton, has teeth in a small head, mouth on the under side, and a protruding jaw, a dorsal skin-flap resembling a fin, and is apparently the link between the salamander and the fish. The discovery is most important to zoologists."

Present day science is not content to collect and observe, however, she desires to experiment whenever possible, and for several years past important work has been done in the experimental study of heredity. Much of this study was carried on at Cold Springs Harbor, where an elaborate experimental station is fitted up and in active operation. Here, three factors in evolution are being especially studied—variation, inheritance and adjustment. Animals, birds, fishes and plants are experimented upon, with important results, in some instances. Thus, Dr. A. M. Banta, one of the associate workers, is investigating the modifications which cave breeding produces in a species. Cave life is associated with loss of sight, loss of pigment, and elongation of antennæ. Dr. W. L. Tower has found he can breed a new Colorado potato in high temperature and dry air, in which the germ-plasm produces less pigment.

There seem to be strong theoretical reasons for believing that the differences in the adult are determined by chemical differences in the egg. These chemical characteristics lie at the bottom of the morphological and physiological characteristics. Miss Lutz has reported on cell-studies in heredity in flowers. She artificially self-pollinated (impregnated with their own pollen) certain plants. They produced offspring; the offspring produced offspring, the characteristics were noted and contrasted with cross-unions, and the effects of different external conditions were studied.

Crosses between cultures of Indian corn of different types have shown more vigor than those belonging to those of a single pure type. Recent studies have introduced the idea of the dominance of the more developed characteristics over the less developed, in heredity. It will be seen, from this, that experimental work has assumed a most important place in modern biological questions, as applied to the animal and vegetable worlds.

Zorn, Anders, Scandinavian painter. b. Dalecarlia, a Swedish Province, in 1860, son of a Bavarian brew-master. His early life was passed as a sheep herder, and his artistic ability manifested itself in the wooden images of animals, which he carved and colored with berry juices. His talent was noticed, and, after an elementary education, he was sent to the Academy of Fine Arts at Stockholm, to study sculpture. In 1875, he decided to become a painter, and in 1880 gave lessons in water coloring. He produced an exquisite water color "In Mourning" and went abroad and painted some clever water colors, which were exhibited at the Royal Academy and the Royal Society for Painting in Water Colors. His art, however, was not fully appreciated in England, and, after traveling through Spain and Morocco, he returned to his native province. In 1889, he began to paint in oil, his first picture being "Fishermen in Cornwall," which was bought by the Musée de Luxembourg, France, and the same year he was awarded the decoration of the Legion of Honor. His portrait of himself, was hung in the Affizi Gallery at Florence, and his painting "A Woman Bathing" in the National Gallery, Berlin. He exhibited a series of paintings from the nude figure at the Columbian Exposition at Chicago, Ill.

APPENDIX

Summary of the United States Census

The following summary of the United States Census for 1910 gives the population of the States and Territories by counties and a list of the cities and towns of each State and territorial division in which the population exceeds 5,000. To this is added such information regarding the agricultural, manufacturing, and other industrial interests of the several States which was issued by the Census Bureau too late to find its proper place in these volumes. The census figures given in this appendix represent the latest reports published prior to 1 May, 1911.

CENSUS OF STATES.

Alabama. Population of the State, 2,138,093. Population by counties: Augusta, 20,038; Baldwin, 18,178; Barbour, 32,728; Bibb, 22,791; Blount, 21,456; Bullock, 30,196; Butler, 29,030; Calhoun, 39,115; Chambers, 36,056; Cherokee, 20,226; Chilton, 23,187; Choctaw, 18,483; Clarke, 30,987; Clay, 21,006; Cleburne, 13,385; Coffee, 26,119; Colbert, 24,802; Conecuh, 21,433; Coosa, 16,634; Covington, 32,124; Crenshaw, 23,313; Cullman, 28,321; Dale, 21,608; Dallas, 53,401; Dekalb, 28,261; Elmore, 28,245; Escambia, 18,889; Etowah, 39,109; Fayette, 16,248; Franklin, 19,369; Geneva, 26,230; Greene, 22,717; Hale, 27,883; Henry, 20,943; Houston, 32,414; Jackson, 32,918; Jefferson, 226,476; Lamar, 17,487; Lauderdale, 30,936; Lawrence, 21,984; Lee, 32,867; Limestone, 26,880; Lowndes, 31,894; Macon, 26,049; Madison, 47,041; Marengo, 39,923; Marion, 17,495; Marshall, 28,553; Mobile, 80,854; Monroe, 27,155; Montgomery, 82,178; Morgan, 33,781; Perry, 31,222; Pickens, 25,055; Pike, 30,815; Randolph, 24,659; Russell, 25,937; St. Clair, 20,715; Shelby, 26,949; Sumter, 28,699; Talladega, 37,921; Tallapoosa, 31,034; Tuscaloosa, 47,559; Walker, 37,013; Washington, 14,454; Wilcox, 33,810; Winston, 12,855.

The following cities and towns in Alabama have a population in excess of 5,000.

Anniston (city), Calhoun county, 12,794.
Bessemer (town), Jefferson county, 10,864.
Birmingham (city), Jefferson co., 132,685.
Dothan (city), Houston county, 7,016.
Florence (city), Lauderdale county, 6,689.
Gadsden (town), Etowah county, 10,557.
Huntsville (town), Madison county, 7,611.
Mobile (city), Mobile county, 51,521.
Montgomery (city), Montgomery co., 38,136.
New Decatur (city), Morgan county, 6,118.
Selma (city), Dallas county, 13,649.
Talladega (city), Talladega county, 5,854.
Tuscaloosa (city), Tuscaloosa co., 8,407.

Alaska. The population of the territory of Alaska is 64,356. No city or town in the Territory has a population of 5,000.

Arizona. Population of the Territory, 204,354. Population by counties: Apache, 9,196; Cochise, 34,591; Coconino, 8,130; Gila, 16,780; Graham, 23,547; Maricopa, 34,488; Mohave,

3,773; Navajo, 11,491; Pima, 22,818; Pinal, 9,045; Santa Cruz, 6,766; Yavapai, 15,996; Yuma, 7,733.

The following cities and towns in Arizona have a population in excess of 5,000;

Bisbee (city), Cochise county, 9,019.
Douglas (city), Cochise county, 6,437.
Globe (city), Gila county, 7,083.
Morenci (town), Graham county, 5,010.
Phoenix (city), Maricopa county, 11,134.
Prescott (city), Yavapai county, 5,092.
Tucson (city), Pima county, 13,193.

Arkansas. Population of the State, 1,574,449. Population by counties: Arkansas, 16,103; Ashley, 25,268; Baxter, 10,389; Benton, 33,389; Boone, 14,318; Bradley, 14,518; Calhoun, 9,894; Carroll, 16,829; Chicot, 21,987; Clark, 23,686; Clay, 23,690; Cleburne, 11,903; Cleveland, 13,481; Columbia, 23,820; Conway, 22,729; Craighead, 27,627; Crawford, 23,942; Crittenden, 22,447; Cross, 14,042; Dallas, 12,621; Desha, 15,274; Drew, 21,960; Faulkner, 23,708; Franklin, 20,638; Fulton, 12,193; Garland, 27,271; Grant, 9,425; Greene, 23,852; Hempstead, 28,285; Hot Spring, 15,022; Howard, 16,898; Independence, 24,776; Izard, 14,561; Jackson, 23,501; Jefferson, 52,734; Johnson, 19,698; Lafayette, 13,741; Lawrence, 20,001; Lee, 24,252; Lincoln, 15,118; Little River, 13,597; Logan, 26,350; Lonoke, 27,983; Madison, 16,056; Marion, 10,203; Miller, 19,555; Mississippi, 30,468; Monroe, 19,907; Montgomery, 12,455; Nevada, 19,344; Newton, 10,621; Ouachita, 21,774; Perry, 9,402; Phillips, 33,535; Pike, 12,565; Poinsett, 12,791; Polk, 17,216; Pope, 24,527; Prairie, 13,853; Pulaski, 86,751; Randolph, 18,987; St. Francis, 22,548; Saline, 16,657; Scott, 14,302; Searcy, 14,825; Sebastian, 52,278; Sevier, 16,616; Sharp, 11,688; Stone, 8,946; Union, 30,723; Van Buren, 13,509; Washington, 33,889; White, 28,574; Woodruff, 20,049; Yell, 26,323.

The following cities in Arkansas have a population in excess of 5,000:

Argenta, Pulaski county, 11,138.
Fort Smith, Sebastian county, 23,975.
Helena, Phillips county, 8,772.
Hot Springs, Garland county, 14,434.
Jonesboro, Craighead county, 7,123.
Little Rock, Pulaski county, 45,941.

APPENDIX

Paragould, Greene county, 5,248
Pine Bluff, Jefferson county, 15,102.
Texarkana, Miller county, 5,655

California. Population of State, 2,377,548; Indians not taxed, 988 Population by counties. Alameda, 246,131; Alpine, 309; Amador, 9,086; Butte, 27,301; Calaveras, 9,171; Colusa, 7,732; Contra Costa, 31,674; Del Norte, 2,417; Eldorado, 7,492; Fresno, 75,657; Glenn, 7,172; Humboldt, 33,857; Imperial, 13,591; Inyo, 6,974; Kern, 37,715; Kings, 16,230; Lake, 5,526; Lassen, 4,802; Los Angeles, 504,131; Madera, 8,368; Marin, 25,114; Mariposa, 3,956; Mendocino, 23,929; Merced, 15,148; Modoc, 6,191; Mono, 2,042; Monterey, 24,146; Napa, 19,800; Nevada, 14,955; Orange, 34,436; Placer, 18,237; Plumas, 5,259; Riverside, 34,696; Sacramento, 67,806; San Benito, 8,041; San Bernardino, 56,706; San Diego, 61,605; San Francisco, 416,912; San Joaquin, 50,731; San Luis Obispo, 19,383; Santa Mateo, 26,585; Santa Barbara, 27,738; Santa Clara, 83,539; Santa Cruz, 26,140; Shasta, 18,920; Sierra, 4,098; Siskiyou, 18,801; Solano, 27,559; Sonoma, 48,394; Stanislaus, 22,522; Sutter, 6,328; Tehama, 11,401; Trinity, 3,301; Tulare, 35,440; Tuolumne, 9,979; Ventura, 18,347; Yolo, 13,920; Yuba, 10,042.

The following cities in California have a population in excess of 5,000:

Alameda, Alameda county, 23,383
Alhambra, Los Angeles county, 5,021.
Bakersfield, Kern county, 12,727
Berkeley, Alameda county, 40,434
Eureka, Humboldt county, 11,845.
Fresno, Fresno county, 24,892
Long Beach, Los Angeles county, 17,809.
Los Angeles, Los Angeles county, 319,198.
Marysville, Yuba county, 5,430.
Napa, Napa county, 5,791
Oakland, Alameda county, 150,174.
Pasadena, Los Angeles county, 30,291.
Petaluma, Sonoma county, 5,880.
Pomona, Los Angeles county, 10,207.
Redlands, San Bernardino county, 10,449.
Richmond, Contra Costa county, 6,802.
Riverside, Riverside county, 15,212
Sacramento, Sacramento county, 44,696.
San Bernardino, San Bernardino co., 12,779
San Diego, San Diego county, 39,578.
San Francisco, San Francisco co., 416,912.
San Jose, Santa Clara county, 28,946.
San Luis Obispo, San Luis Obispo co., 5,157.
San Rafael, Marin county, 5,934.
Santa Ana, Orange county, 8,429.
Santa Barbara, Santa Barbara co., 11,659.
Santa Cruz, Santa Cruz county, 11,146
Santa Monica, Los Angeles county, 7,847
Santa Rosa, Sonoma county, 7,817
Stockton, San Joaquin county, 23,253.
Vallejo, Solano county, 11,340.

Colorado. Population of State, 799,024; Indians not taxed. Population by counties Adams, 8,892; Arapahoe, 10,263; Archuleta, 3,302; Baca, 2,516; Bent, 5,043; Boulder, 30,330; Chaffee, 7,622; Chayenne, 3,687; Clear Creek, 5,001; Conejos, 11,285; Costilla, 5,498; Custer, 1947; Delta, 13,688; Denver, 213,381; Dolores, 642; Douglas, 3,192; Eagle, 2,985; El Paso, 43,321; Elbert, 5,331; Fremont, 18,181; Garfield, 10,144; Gilpin, 4,131; Grand, 1,862; Gunnison, 5,897; Hinsdale, 646; Huerfano, 13,320; Jackson, 1,013; Jefferson, 14,231; Kiowa, 2,899; Kit Carson, 7,483; La Plata, 10,812; Lake, 10,600; Larimer, 25,270; Las Animas, 33,643; Lincoln, 5,917; Logan, 9,549; Mesa, 22,197; Mineral, 1,239; Montezuma, 5,029; Montrose, 10,291; Morgan, 5,577; Otero, 20,201; Ouray, 3,514; Park, 2,492; Phillips, 3,179; Pitkin, 4,500; Powers, 9,520; Pueblo, 52,223; Rio Blanco, 2,332; Rio Grande, 6,563; Routt, 7,561; Saguache, 4,160; San Juan, 3,063; San Miguel, 4,700; Sedgwick, 3,061; Summit, 2,003; Teller, 14,351; Washington, 6,002; Weld, 39,177; Yuma, 8,499

The following cities in Colorado have a population in excess of 5,000

Boulder, Boulder county, 9,539
Canon, Fremont county, 5,162.
Colorado Springs, El Paso county, 29,078
Cripple Creek, Teller county, 6,206.
Denver, Denver county, 213,381
Fort Collins, Larimer county, 8,210.
Grand Junction, Mesa county, 7,754.
Greeley, Weld county, 8,179
Leadville, Lake county, 7,508.
Pueblo, Pueblo county, 41,395
Trinidad, Las Animas county, 10,204.

Connecticut. Population of State, 1,114,756. Population by counties Fairfield, 245,322; Hartford, 250,182; Litchfield, 70,260; Middlesex, 45,637; New Haven, 337,282; New London, 91,253; Tolland, 26,459; Windham, 48,361.

The following cities and boroughs in Connecticut have a population in excess of 5,000.

Ansonia (city), New Haven county, 15,152.
Bridgeport (city), Fairfield county, 102,054.
Bristol (borough), Hartford county, 9,527.
Danbury (city), Fairfield county, 20,234
Derby (city), New Haven county, 8,991
Hartford (city), Hartford county, 98,915
Meriden (city), New Haven county, 27,265
Middletown (city), Middlesex county, 11,851
Naugatuck (borough), New Haven county, 12,722.
New Britain (city), Hartford county, 43,916.
New Haven (city), New Haven co., 133,605.
New London (city), New London co., 19,659.
Norwalk (city), Fairfield county, 6,954
Norwich (city), New London county, 20,367.
Putnam (city), Windham county, 6,637.
Rockville (city), Tolland county, 7,977.
South Norwalk (city), Fairfield co., 8,968.
Stamford (city), Fairfield county, 25,138.
Torrington (borough), Litchfield co., 15,483
Wallingford (borough), New Haven county, 8,690.

Waterbury (city), New Haven co., 73,141.
Willimantic (city), Windham county, 11,230
Winsted (borough) Litchfield county, 7,754.

Delaware. Population of State, 202,322. Population by counties Kent, 32,721; New Castle, 123,188; Sussex, 46,413

Population in excess of 5,000

Wilmington, New Castle county, 87,411.

District of Columbia. The population of the District is 351,069 The population of Washington (city) is 331,069

Florida. Population of State, 752,619 Population by counties Alachua, 34,305; Baker, 4,805; Bradford, 14,090; Brevard, 4,717; Calhoun, 7,465; Citrus, 6,731; Clay, 6,116; Columbia, 17,689; Dade, 11,933; De Soto, 14,200; Duval, 75,163; Escambia, 36,549; Franklin, 5,201; Gadsden, 22,198; Hamilton, 11,825; Hernando, 4,997; Hillsboro, 78,374; Holmes, 11,557; Jackson, 29,821; Jefferson, 17,210; Lafayette, 6,710; Lake, 9,509; Lee, 6,294; Leon, 19,427; Levy, 10,361; Liberty, 4,700; Madison, 16,919; Manatee, 11,800

CENSUS OF STATES

9,550; Marion, 26,941; Monroe, 21,563, Nassau, 10,525; Orange, 19,107, Osceola, 5,507, Palm Beach, 5,577; Pasco, 7,502, Polk, 24,148, Putnam, 13,096, St John, 13,208, St Lucie, 4,075; Santa Rosa, 14,897, Sumter, 6,696, Suwanee, 18,603, Taylor, 7,103, Volusia, 16,510, Wakulla, 4,802; Walton, 16,460, Washington, 16,403

The following cities in Florida have a population in excess of 5,000

Gainesville, Alachua county, 6,183.
Jacksonville, Duval county, 57,699
Key West, Monroe county, 19,945.
Lake City, Columbia county, 5,032.
Miami, Dade county, 5,471
Pensacola, Escambia county, 22,922.
St Augustine, St John county, 5,494.
Tallahassee, Leon county, 5,018
Tampa, Hillsboro county, 37,782.
West Tampa, Hillsboro county, 8,258.

Georgia. Population of State, 2,609,121.

Population by counties Appling, 12,318, Baker, 7,973, Baldwin, 18,354; Banks, 11,244, Bartow, 25,388, Ben Hill, 11,863, Berrien, 22,772, Bibb, 56,646, Brooks, 23,832; Bryan, 6,702, Bulloch, 26,464, Burke, 27,268; Butts, 13,624, Calhoun, 11,334, Camden, 7,090; Campbell, 10,874, Carroll, 30,855, Catoosa, 7,184, Charlton, 4,722; Chatham, 79,690; Chattahoochee, 5,586, Chattooga, 13,608, Cherokee, 16,661, Clarke, 23,273; Clay, 8,960, Clayton, 10,453, Clinch, 8,424; Cobb, 28,397; Coffee, 21,953, Colquitt, 19,789, Columbia, 12,328, Coweta, 28,800, Crawford, 8,310; Crisp, 16,423; Dade, 4,139, Dawson, 4,686; Decatur, 29,045; DeKalb, 27,881; Dodge, 20,127; Dooley, 20,554; Dougherty, 16,035, Douglas, 8,953; Early, 18,122; Echols, 3,309; Effingham, 9,971; Elbert, 24,125, Emanuel, 25,140, Fannin, 12,574; Fayette, 10,966; Floyd, 36,736, Forsyth, 11,940; Franklin, 17,894, Fulton, 177,733, Gilmer, 9,237; Glascock, 4,669, Glynn, 15,720; Gordon, 15,861, Grady, 18,457, Greene, 18,512; Gwinnett, 28,824; Habersham, 10,134; Hall, 25,730, Hancock, 19,189; Haralson, 13,514, Harris, 17,886; Hart, 16,216; Heard, 11,189, Henry, 19,927; Houston, 23,609; Irwin, 10,461, Jackson, 30,169; Jasper, 16,552; Jeff Davis, 6,050; Jefferson, 21,379; Jenkins, 11,520, Johnson, 12,897; Jones, 13,103; Laurens, 35,501; Lee, 11,679; Liberty, 12,924, Lincoln, 8,714, Lowndes, 24,436; Lumpkin, 5,444; McDuffie, 10,325; McIntosh, 6,442; Macon, 15,016, Madison, 16,851, Marion, 9,147, Meriwether, 25,180, Miller, 7,986; Milton, 7,239; Mitchell, 22,114; Monroe, 20,450; Montgomery, 19,638; Morgan, 19,717, Murray, 9,763; Muscogee, 36,227; Newton, 18,449; Oconee, 11,104; Oglethorpe, 18,680; Paulding, 14,124; Pickens, 9,041; Pierce, 10,749; Pike, 19,495; Polk, 20,203; Pulaski, 22,835; Putnam, 13,876; Quitman, 4,594; Rabun, 5,562; Randolph, 18,841; Richmond, 58,886; Rockdale, 8,916; Schley, 5,213; Screven, 20,202; Spalding, 19,741; Stephens, 9,728; Stewart, 13,437; Sumter, 29,092, Talbot, 11,696; Taliaferro, 8,766; Tattnall, 18,509, Taylor, 10,839; Telfair, 13,288; Terrell, 22,003; Thomas, 29,071; Tift, 11,487; Toombs, 11,206; Towns, 3,932; Troup, 26,228; Turner, 10,075; Twiggs, 10,736; Union, 6,918; Upson, 12,757; Walker, 18,692; Walton, 25,393; Ware, 22,957; Warren, 11,860; Washington, 28,174; Wayne, 13,069; Webster, 6,151; White, 5,110; Whitfield, 15,934; Wilcox, 13,486; Wilkes, 23,441; Wilkinson, 10,078; Worth, 19,147

The following cities and towns in Georgia have a population in excess of 5,000:

Albany (city), Dougherty county, 8,190.
Americus (city), Sumter county, 8,063
Athens (city), Clarke county, 14,913.
Atlanta (city), Dekalb and Fulton counties, 154,839
Augusta (city), Richmond county, 41,040.
Brunswick (city), Glynn county, 10,182
Columbus (city), Muscogee county, 20,554
Cordele (city), Crisp county, 5,883
Dalton (city), Whitfield county, 5,324
Dublin (city), Laurens county, 5,795
Elberton (city), Elbert county, 6,483.
Fitzgerald (city), Ben Hill county, 5,795
Gainesville (city), Hall county, 5,925.
Griffin (city), Spalding county, 7,478
La Grange (city), Troup county, 5,587.
Macon (city), Bibb county, 40,665
Marietta (city), Cobb county, 5,949
Newnan (city), Coweta county, 5,548
Rome (city), Floyd county, 12,099
Savannah (city), Chatham county, 65,064
Thomasville (town), Thomas county, 6,727
Valdosta (city), Lowndes county, 7,656.
Waycross (city), Ware county, 14,485

Hawaii. Population of the Territory, 191,909
Population by islands Kauai and Niihau, 23,952; Oahu, 82,028, Hawaii, 55,382, Kalawao, 785; Kahoolawe, Lanai, Maui and Molokai, 29,762

The city of Honolulu has a population of 52,183; the town of Hilo, Hawaii Island, has a population of 6,745.

Idaho. Population of State, 325,594; Indians not taxed, 2,154
Population by counties Ada, 29,088; Bannock, 19,242, Bear Lake, 7,729; Bingham, 23,306, Blaine, 8,387, Boise, 5,250; Bonner, 13,588; Canyon, 25,323; Cossia, 7,197; Custer, 3,001, Elmore, 4,785; Fremont, 24,606, Idaho, 12,384; Kootenai, 22,747; Latah, 18,818; Lemhi, 4,786, Lincoln, 12,676, Nez Perce, 24,850; Oneida, 15,170, Owyhee, 4,041; Shoshone, 13,963; Twin Falls, 13,543; Washington, 11,101

The following cities in Idaho have a population in excess of 5,000.

Boise, Ada county, 17,358
Coeur d'Alene, Kootenai county, 7,291.
Lewiston, Nez Perce county, 6,043.
Pocatello, Bannock county, 9,110
Twin Falls, Twin Falls county, 5,258

Illinois. Population of State, 5,638,591.
Population by counties Adams, 64,588; Alexander, 22,741; Bond, 17,075, Boone, 15,481; Brown, 10,397; Bureau, 43,975; Calhoun, 8,610; Carroll, 18,035; Cass, 17,372; Champaign, 51,829; Christian, 34,594; Clark, 23,517, Clay, 18,661; Clinton, 22,832; Coles, 34,517; Cook, 240,523; Crawford, 26,281; Cumberland, 14,281; Dekalb, 33,457; Dewitt, 18,906; Douglas, 19,591, Dupage, 33,432; Edgar, 27,336; Edwards, 10,049; Effingham, 20,055, Fayette, 28,075; Ford, 17,096; Franklin, 25,943; Fulton, 49,549; Gallatin, 14,628; Greene, 22,363; Grundy, 24,162; Hamilton, 18,227; Hancock, 30,638, Hardin, 7,015; Henderson, 9,724; Henry, 41,736; Iroquois, 35,543; Jackson, 35,143; Jasper, 18,157; Jefferson, 29,111; Jersey, 13,954; Jo Daviess, 22,657, Johnson, 14,331; Kane, 91,862, Kankakee, 40,752; Kendall, 10,777; Knox, 46,159; Lake, 55,058; LaSalle, 90,132; Lawrence, 22,661; Lee, 27,750; Livingston, 40,465; Logan, 30,216; McDonough, 26,887; McHenry, 32,509; McLean, 68,008; Macon, 54,186; Macoupin, 50,685; Madison, 89,000

APPENDIX

847; Marion, 35,094; Marshall, 15,679; Mason, 17,377; Massac, 14,200; Menard, 12,796; Mercer, 19,723; Monroe, 13,508; Montgomery, 35,311; Morgan, 34,420; Moultrie, 14,630; Ogle, 27,864; Peoria, 100,255; Perry, 22,088; Platt, 16,376; Pike, 28,622; Pope, 11,215; Pulaski, 15,650; Putnam, 7,561; Randolph, 29,120; Richland, 15,970; Rock Island, 70,404; St. Clair, 119,870; Saline, 30,204; Sangamon, 91,024; Schuyler, 14,852; Scott, 10,067; Shelby, 31,693; Stark, 10,098; Stephenson, 36,821; Tazewell, 34,027; Union, 21,856; Vermilion, 77,996; Wabash, 14,913; Washington, 18,759; Wayne, 25,697; White, 23,052; Whiteside, 34,507; Will, 84,371; Williamson, 45,098; Winnebago, 63,153; Woodford, 20,506.

The following cities, towns and villages in Illinois have a population in excess of 5,000:

Alton (city), Madison county, 17,528
Aurora (city), Kane county, 29,807.
Beardstown (city), Cass county, 6,107.
Belleville (city), St. Clair county, 21,122.
Belvidere (city), Boone county, 7,253
Berwyn (city), Cook county, 5,841.
Bloomington (city), McLean county, 25,768.
Blue Island (village), Cook county, 8,043.
Cairo (city), Alexander county, 14,548.
Canton (city), Fulton county, 10,453
Carbondale (city), Jackson county, 5,411
Centralia (city), Clinton and Marion counties, 9,680
Campaign (city), Campaign county, 12,421.
Charleston (city), Coles county, 5,884
Chicago (city), Cook county, 2,185,283
Chicago Heights (city), Cook county, 14,525.
Cicero (town), Cook county, 14,557.
Clinton (city), Dewitt county, 5,165
Collinsville (city), Madison county, 7,478
Danville (city), Vermilion county, 27,871.
Decatur (city), Macon county, 31,140.
Dekalb (city), Dekalb county, 8,102
Dixon (city), Lee county, 7,216.
Duquoin (city), Perry county, 5,454.
East St. Louis (city), St. Clair co., 58,547
Edwardsville (city), Madison county, 5,014
Elgin (city), Cook and Kane counties, 25,976.
Evanston (city), Cook county, 24,978.
Forest Park (village), Cook county, 6,594.
Freeport (city), Stephenson county, 17,567
Galesburg, (city), Knox county, 22,089.
Granite (city), Madison county, 9,903
Harrisburg (city), Saline county, 5,309.
Harvey (city), Cook county, 7,227.
Harrin (city), Williamson county, 6,861.
Jacksonville (city), Morgan county, 15,326.
Joliet (city), Will county, 34,670
Kankakee (city), Kankakee county, 13,986.
Kewanee (city), Henry county, 9,307.
La Grange (village), Cook county, 5,282.
Lasalle (city), Lasalle county, 11,537.
Lincoln (city), Logan county, 10,829.
Litchfield (city), Montgomery county, 5,971.
Macomb (city), McDonough county, 5,774.
Madison (village), Madison county, 5,046.
Marion (city), Williamson county, 7,093.
Mattoon (city), Coles county, 11,456.
Maywood (village), Cook county, 8,033.
Moline (city), Rock Island county, 24,199.
Monmouth (city), Warren county, 9,128
Mt. Carmel (city), Wabash county, 6,934.
Mt. Vernon (city), Jefferson county, 8,007.
Murphysboro (city), Jackson county, 7,485.
Oak Park (village), Cook county, 19,444
Olney (city), Richland county, 5,011

Ottawa (city), Lasalle county, 9,535.
Pana (city), Christian county, 6,055.
Paris (city), Edgar county, 7,664.
Pekin (city), Tazewell county, 9,897.
Peoria (city), Peoria county, 66,950.
Peru (city), Lasalle county, 7,984
Pontiac (city), Livingston county, 6,090
Quincy (city), Adams county, 36,587.
Rock Island (city), Rock Island co., 24,335
Rockford (city), Winnebago county, 45,401
Springfield (city), Sangamon county, 51,075
Spring Valley (city), Bureau county, 7,035
Staunton (city), Macoupin county, 5,048
Sterling (city), Whiteside county, 7,467
Streator (city), Lasalle county, 14,253.
Taylorville (city), Christian county, 5,446.
Urbana (city), Champaign county, 8,245
Waukegan (city), Lake county, 16,069.

Indiana. Population of State, 2,700,876
Population by counties. Adams, 21,840; Allen, 93,386; Bartholomew, 24,813; Benton, 12,688; Blackford, 15,820; Boone, 24,673; Brown, 7,975; Carroll, 17,970; Cass, 36,368; Clark, 30,250; Clay, 32,535; Clinton, 26,674; Crawford, 12,057; Daviess, 27,747; Dearborn, 21,396; Decatur, 18,793; Dekalb, 25,054; Delaware, 51,414; Dubois, 19,843; Elkhart, 49,008; Fayette, 14,415; Floyd, 30,293; Fountain, 20,439; Franklin, 15,335; Fulton, 16,879; Gibson, 30,137; Grant, 51,426; Greene, 36,873; Hamilton, 27,026; Hancock, 19,030; Harrison, 20,232; Hendricks, 20,840; Henry, 29,758; Howard, 33,177; Huntington, 28,982; Jackson, 24,727; Jasper, 13,044; Jay, 24,961; Jefferson, 20,483; Jennings, 14,203; Johnson, 20,934; Knox, 39,183; Kosciusko, 27,936; Lagrange, 15,148; Lake, 82,864; Laporte, 45,797; Lawrence, 30,625; Madison, 65,224; Marion, 263,661; Marshall, 24,175; Martin, 12,950; Miami, 29,350; Monroe, 23,426; Montgomery, 29,296; Morgan, 21,182; Newton, 10,504; Noble, 24,007; Ohio, 4,320; Orange, 17,192; Owen, 14,053; Parke, 22,214; Perry, 18,078; Pike, 19,684; Porter, 20,540; Posey, 21,670; Pulaski, 13,312; Putnam, 20,520; Randolph, 29,013; Ripley, 19,452; Rush, 19,349; St. Joseph, 84,312; Scott, 8,323; Selby, 26,802; Spencer, 20,676; Starke, 10,567; Steuben, 14,274; Sullivan, 32,439; Switzerland, 9,914; Tippecanoe, 40,063; Tipton, 17,459; Union, 6,260; Vanderburg, 77,438; Vermilion, 18,865; Vigo, 87,930; Wabash, 26,926; Warren, 10,899; Warrick, 21,911; Washington, 17,445; Wayne, 43,757; Wells, 22,418; White, 17,602; Whitley, 16,892.

The following cities in Indiana have a population in excess of 5,000

Alexandria, Madison county, 5,096.
Anderson, Madison county, 22,476.
Bedford, Lawrence county, 8,716.
Bloomington, Monroe county, 8,838.
Brazil, Clay county, 9,340
Clinton, Vermilion county, 6,229.
Columbus, Bartholomew county, 8,813.
Connersville, Fayette county, 7,738.
Crawfordsville, Montgomery county, 9,371.
East Chicago, Lake county, 19,098.
Elkhart, Elkhart county, 19,282.
Elwood, Madison county, 11,028.
Evansville, Vanderburg county, 69,647.
Fort Wayne, Allen county, 63,933.
Frankfort, Clinton county, 8,634
Gary, Lake county, 16,802.
Goshen, Elkhart county, 8,514
Greensburg, Decatur county, 5,420.
Hammond, Lake county, 20,925.
Hartford, Blackford county, 6,187.

CENSUS OF STATES

Huntington, Huntington county, 10,272.
 Indianapolis, Marion county, 233,650
 Jeffersonville, Clark county, 10,412
 Kokomo, Howard county, 17,010
 Lafayette, Tippecanoe county, 20,081.
 Laporte, Laporte county, 10,525
 Lebanon, Boone county, 5,474
 Linton, Greene county, 5,906
 Logansport, Cass county, 19,050
 Madison, Jefferson county, 6,934
 Marion, Grant county, 19,359.
 Michigan City, Laporte county, 19,027.
 Mishawaka, St Joseph county, 11,886.
 Mount Vernon, Posey County, 5,563
 Muncie, Delaware county, 24,005
 New Albany, Floyd county, 20,629
 New Castle, Henry county, 9,446.
 Noblesville, Hamilton county, 5,073.
 Peru, Miami county, 10,910
 Portland, Jay county, 5,130
 Princeton, Gibson county, 6,448
 Richmond, Wayne county, 22,324.
 Seymour, Jackson county, 6,305.
 Shelbyville, Shelby county, 9,500.
 South Bend, St Joseph county, 53,684.
 Terre Haute, Vigo county, 58,157.
 Valparaiso, Porter county, 6,987.
 Vincennes, Knox county, 14,895.
 Wabash, Wabash county, 8,687
 Washington, Daviess county, 7,854.
 Whiting, Lake county, 6,587.

Iowa. Population of State, 2,224,771. Pop-
 ulation by counties: Adair, 14,420; Adams, 10,-
 998; Allamakee, 17,338; Appanoose, 28,701;
 Audubon, 12,671; Benton, 23,156; Blackhawk,
 44,865; Boone, 27,626; Bremer, 15,834; Buch-
 anan, 19,748; Buena Vista, 15,981; Butler, 17,-
 119; Calhoun, 17,090; Carroll, 20,117; Cass, 19,-
 047; Cedar, 17,765; Cerro Gordo, 25,011; Chero-
 kee, 16,741; Chickasaw, 15,375; Clarke, 10,736;
 Clay, 12,766; Clayton, 25,576; Clinton, 45,394;
 Crawford, 20,041; Dallas, 23,628; Davis, 13,315;
 Decatur, 16,347; Delaware, 17,888; Des Moines,
 36,145; Dickinson, 8,137; Dubuque, 57,450; Em-
 met, 9,816; Fayette, 27,919; Floyd, 17,119;
 Franklin, 14,780; Fremont, 15,623; Greene, 16,-
 023; Grundy, 13,574; Guthrie, 17,374; Hamilton,
 19,242; Hancock, 12,731; Hardin, 20,921; Harri-
 son, 23,162; Henry, 18,640; Howard, 12,920;
 Humboldt, 12,182; Ida, 11,296; Iowa, 18,409;
 Jackson, 21,258; Jasper, 27,034; Jefferson, 15,-
 951; Johnson, 25,914; Jones, 19,050; Keokuk,
 21,160; Kossuth, 21,971; Lee, 36,702; Linn, 60,-
 720; Louisa, 12,855; Lucas, 13,462; Lyon, 14,-
 624; Madison, 15,621; Mahaska, 29,860; Marion,
 22,095; Marshall, 30,279; Mills, 15,811; Mitchell,
 13,435; Monona, 16,633; Monroe, 25,429; Mont-
 gomery, 16,604; Muscatine, 29,505; O'Brien, 17,-
 262; Osceola, 8,956; Page, 24,002; Palo Alto, 13,-
 845; Plymouth, 23,129; Pocahontas, 14,808;
 Polk, 110,438; Pottawattamie, 55,832; Powes-
 heik, 19,589; Ringgold, 12,904; Sac, 16,555;
 Scott, 60,000; Shelby, 16,552; Sioux, 25,248;
 Story, 24,083; Tama, 22,156; Taylor, 16,312;
 Union, 16,616; Van Buren, 15,020; Wapello,
 37,743; Warren, 18,194; Washington, 19,925;
 Wayne, 16,184; Webster, 34,629; Winnebago,
 11,914; Winneshiek, 21,729; Woodbury, 67,616,
 Worth, 9,950; Wright, 17,951.

The following cities and towns in Iowa have
 a population in excess of 5,000
 Boone (city), Boone county, 10,347.
 Burlington (city), Des Moines co, 24,324.
 Cedar Falls (city), Blackhawk co, 5,012

Cedar Rapids (city), Linn county, 32,811.
 Centerville (city), Appanoose county, 6,936.
 Charles City (city), Floyd county, 5,892.
 Clinton (city), Clinton county, 25,577
 Council Bluffs (city), Pottawattamie county,
 29,292.
 Creston (city), Union county, 6,924.
 Davenport (city), Scott county, 43,028.
 Des Moines (city), Polk county, 86,368
 Dubuque (city), Dubuque county, 38,494.
 Fort Dodge (city), Webster county, 15,543.
 Fort Madison (city), Lee county, 8,900
 Grinnell (city), Poweshiek county, 5,036.
 Iowa City (city), Johnson county, 10,091.
 Keokuk (city), Lee county, 14,008.
 Marshalltown (city), Marshall co., 13,374.
 Mason City (city), Cerro Gordo co, 11,230.
 Muscatine (city), Muscatine county, 16,178.
 Oelwein (city), Fayette county, 6,028
 Oskaloosa (city), Mahaska county, 9,466.
 Ottumwa (town), Wapelle county, 22,012.
 Sioux City (city), Woodbury county, 47,828.
 Waterloo (city), Blackhawk county, 26,693.
 Webster City (city), Hamilton county, 5,208

Kansas. Population of State, 1,690,949
 Population by counties Allen, 27,640; Ander-
 son, 13,829; Atchison, 28,130; Barber, 9,916;
 Barton, 17,876; Bourbon, 24,007; Brown, 21,-
 314; Butler, 23,059; Chase, 7,527; Chautauqua,
 11,420; Cherokee, 38,162; Cheyenne, 4,248;
 Clark, 4,093; Clay, 15,251; Cloud, 18,388; Coffey,
 15,205; Comanche, 3,281; Cowley, 31,790; Craw-
 ford, 51,178; Decator, 8,976; Dickinson, 24,361;
 Doniphan, 14,422; Douglas, 24,724; Edwards,
 7,033; Elk, 10,128; Ellis, 12,170; Ellsworth, 10,-
 444; Finney, 6,908; Ford, 11,393; Franklin, 20,-
 884; Geary, 12,681; Gove, 6,044; Graham, 8,700;
 Grant, 1,087; Gray, 3,121; Greeley, 1,335; Green-
 wood, 16,060; Hamilton, 3,360; Harper, 14,748;
 Harvey, 19,200; Haskell, 993; Hodgeman, 2,930;
 Jackson, 16,861; Jefferson, 15,826; Jewell, 18,-
 148; Johnson, 18,288; Kearny, 3,206; Kingman,
 13,386; Kiowa, 6,174; Labette, 31,423; Lane,
 2,603; Leavenworth, 41,207; Lincoln, 10,142;
 Linn, 14,735; Logan, 4,240; Lyon, 24,927; Mc-
 Pherson, 21,521; Marion, 22,415; Marshall, 23,-
 880; Meade, 5,055; Miami, 20,030; Mitchell,
 14,089; Montgomery, 49,474; Morris, 12,397;
 Morton, 1,333; Nemaha, 19,072; Neesho, 23,754;
 Ness, 5,883; Norton, 11,614; Osage, 19,905; Os-
 borne, 12,827; Ottawa, 11,811; Pawnee, 8,859;
 Phillips, 14,150; Pottawatomie, 17,522; Pratt,
 11,156; Rawlins, 6,380; Reno, 37,853; Republic,
 17,447; Rice, 15,106; Riley, 15,783; Rooks, 11,-
 282; Rush, 7,826; Russell, 10,800; Saline, 20,338;
 Scott, 3,047; Sedgwick, 73,095; Seward, 4,091;
 Shawnee, 61,874; Sheridan, 5,651; Sherman,
 4,549; Smith, 15,365; Stafford, 12,510; Stanton,
 1,034; Stevens, 2,453; Sumner, 30,654; Thomas,
 5,455; Trego, 5,398; Wabaunsee, 12,721; Wal-
 lace, 2,759; Washington, 20,229; Wichita, 2,006;
 Wilson, 19,810; Woodson, 9,450; Wyandotte,
 100,068.

The following cities in Kansas have a popu-
 lation in excess of 5,000
 Arkansas City, Crowley county, 7,508
 Atchison, Atchison county, 16,429.
 Chanute, Neosho county, 9272.
 Coffeyville, Montgomery county, 12,687.
 Emporia, Lyon county, 9,058.
 Fort Scott, Bourbon county, 10,463.
 Galena, Cherokee county, 6,096
 Hutchinson, Reno county, 16,364.
 Independence, Montgomery county, 10,480.

APPENDIX

Iola, Allen county, 9,032
 Junction, Geary county, 5,598
 Kansas City, Wyandotte county, 82,331
 Lawrence, Douglas county, 12,374
 Leavenworth, Leavenworth county, 19,363.
 Manhattan, Riley county, 5,722
 Newton, Harvey county, 7,862.
 Ottawa, Franklin county, 7,650
 Parsons, Labette county, 12,463.
 Pittsburg, Crawford county, 14,755.
 Rosedale, Wyandotte county, 5,960.
 Salina, Saline county, 9,688.
 Topeka, Shawnee county, 43,684
 Wellington, Sumner county, 7,034.
 Wichita, Sedgwick county, 52,450.
 Winfield, Crowley county, 6,700.

Kentucky. Population of the State, 2,289,905 Population by counties. Adair, 16,503; Allen, 14,882; Anderson, 10,146; Ballard, 12,690; Barren, 25,293; Bath, 13,988; Bell, 28,447; Boone, 9,420; Bourbon, 17,462; Boyd, 23,444; Boyle, 14,668; Bracken, 10,308; Breathitt, 17,540; Breckinridge, 21,034; Bullitt, 9,487; Butler, 15,805; Caldwell, 14,063; Calloway, 19,867; Campbell, 59,369; Carlisle, 9,048; Carroll, 8,110; Carter, 21,966; Casey, 15,479; Christian, 38,845; Clark, 17,987; Clay, 17,789; Clinton, 8,153; Crittenden, 13,296; Cumberland, 9,846; Daviess, 41,020; Edmonson, 10,469; Elliott, 9,814; Estill, 12,273; Fayette, 47,715; Fleming, 16,066; Floyd, 18,623; Franklin, 21,135; Fulton, 14,114; Gallatin, 4,097; Garrard, 11,894; Grant, 10,581; Graves, 33,539; Grayson, 19,958; Green, 11,871; Greenup, 18,475; Hancock, 8,512; Hardin, 22,696; Harlan, 10,566; Harrison, 16,873; Hart, 18,173; Henderson, 29,352; Henry, 13,716; Hickman, 11,750; Hopkins, 34,291; Jackson, 10,734; Jefferson, 262,920; Jessamine, 12,613; Johnson, 17,482; Kenton, 70,355; Knott, 10,791; Knox, 22,116; Larue, 10,701; Laurel, 19,872; Lawrence, 20,067; Lee, 9,531; Leslie, 8,976; Letcher, 10,623; Lewis, 16,887; Lincoln, 17,897; Livingston, 10,627; Logan, 24,977; Lyon, 9,423; McCracken, 35,064; McLean, 13,241; Madison, 26,951; Magoffin, 13,654; Marion, 16,330; Marshall, 15,771; Martin, 7,291; Mason, 18,611; Meade, 9,783; Menifee, 6,153; Mercer, 14,063; Metcalfe, 10,453; Monroe, 13,663; Montgomery, 12,868; Morgan, 16,259; Muhlenberg, 28,598; Nelson, 16,830; Nicholas, 10,601; Ohio, 27,642; Oldham, 7,248; Owen, 14,248; Owsley, 7,979; Pendleton, 11,985; Perry, 11,255; Pike, 31,679; Powell, 6,268; Pulaski, 35,986; Robertson, 4,121; Rockcastle, 14,473; Rowan, 9,438; Russell, 10,861; Scott, 16,956; Selby, 18,041; Simpson, 11,460; Spencer, 7,567; Taylor, 11,961; Todd, 16,488; Trigg, 14,539; Trimble, 6,512; Union, 19,886; Warren, 30,579; Washington, 13,940; Wayne, 17,518; Webster, 20,974; Whitley, 31,982; Wolfe, 9,864; Woodford, 12,571.

The following cities in Kentucky have a population in excess of 5,000

Ashland, Boyd county, 8,688.
 Bellevue, Campbell county, 6,683.
 Bowling Green, Warren county, 9,173.
 Covington, Kenton county, 53,270.
 Danville, Boyle county, 5,420.
 Dayton, Campbell county, 6,979.
 Frankfort, Franklin county, 10,465.
 Henderson, Henderson county, 11,452.
 Hopkinsville, Christian county, 9,419.
 Lexington, Fayette county, 35,099.
 Louisville, Jefferson county, 223,928.
 Mayfield, Graves county, 5,916

Maysville, Mason county, 6,141.
 Middlesboro, Bell county, 7,305.
 Newport, Campbell county, 30,309.
 Owensboro, Davies county, 16,011.
 Paducah, McCracken county, 22,760.
 Paris, Bourbon county, 5,859.
 Richmond, Madison county, 5,340.
 Winchester, Clark county, 7,156.

Louisiana. Population of the State, 1,656,388 Population by parishes Acadia, 31,847; Ascension, 23,887; Assumption, 24,128; Avoyelles, 34,102; Bienville, 21,776; Bossier, 21,738; Caddo, 58,200; Calcasieu, 62,767; Caldwell, 8,593; Cameron, 4,288; Catahoula, 10,415; Claiborne, 25,050; Concordia, 14,278; De Soto, 27,689; East Baton Rouge, 34,580; East Carroll, 11,637; East Feliciana, 20,055; Franklin, 11,989; Grant, 15,958; Iberia, 31,202; Iberville, 30,954; Jackson, 13,813; Jefferson, 18,247; LaSalle, 9,402; Lafayette, 28,733; Lafourche, 33,111; Lincoln, 18,485; Livingston, 10,627; Madison, 10,676; Morehouse, 18,786; Natchitoches, 36,455; Orleans, 339,075; Ouachita, 25,830; Plaquemines, 12,524; Pointe Coupee, 25,289; Rapides, 44,545; Red River, 11,402; Richland, 15,769; Sabine, 19,874; St Bernard, 5,277; St. Charles, 11,207; St. Helena, 9,172; St. James, 23,009; St. John the Baptist, 14,338; St. Landry, 66,661; St. Martin, 23,070; St. Mary, 39,368; St. Tammany, 18,917; Tangipahoa, 29,160; Tensas, 17,060; Terrebonne, 28,320; Union, 20,451; Vermilion, 26,390; Vernon, 17,384; Washington, 18,886; Webster, 19,186; West Baton Rouge, 12,636; West Carroll, 6,249; West Feliciana, 13,449; Winn, 18,357.

The following cities and towns in Louisiana have a population in excess of 5,000

Alexandria (city), Rapides parish, 11,213.
 Baton Rouge (city), East Baton Rouge parish, 14,897.
 Crowley (city), Acadia parish, 5,099.
 Houma (town), Terrebonne parish, 5,024.
 LaFayette (town), LaFayette parish, 6,392.
 Lake Charles (city), Calcasieu parish, 11,449.
 Monroe (city), Ouachita parish, 10,209.
 Morgan City (city), St. Mary parish, 5,477.
 New Orleans (city), Orleans parish, 339,075.
 Shreveport (city), Caddo parish, 28,015.

Maine. Population of the State, 742,731. Population by counties. Androscoggin, 59,822; Aroostook, 74,664; Cumberland, 112,014; Franklin, 19,119; Hancock, 35,575; Kennebec, 62,863; Knox, 28,081; Lincoln, 18,216; Oxford, 36,256; Penobscot, 85,285; Piscataquis, 19,887; Sagadahoc, 18,574; Somerset, 36,301; Waldo, 23,383; Washington, 42,905; York, 68,526.

The following cities and villages in Maine have a population in excess of 5,000

Auburn (city), Androscoggin county, 15,064.
 Augusta (city), Kennebec county, 13,211.
 Bangor (city), Penobscot county, 24,803.
 Bath (city), Sagadahoc county, 9,396.
 Biddeford (city), York county, 17,079.
 Brewer (city), Penobscot county, 5,667.
 Brunswick, (village), Cumberland co., 5,341.
 Calais (city), Washington county, 6,116.
 Gardiner (city), Kennebec county, 5,311.
 Lewiston (city), Androscoggin co., 26,247.
 Old Town (city), Penobscot county, 6,317.
 Portland (city), Cumberland county, 58,571.
 Rockford (city), Knox county, 8,174.
 Rumford Falls (village) Oxford co., 5,427.
 Saco (city), York county, 6,583.
 South Portland (city), Cumberland co., 7,471.

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Waterville (city), Kennebec county, 11,458.
Westbrook (city), Cumberland co, 8,281

Maryland. Population of the State, 1,295,-346. Population by counties Allegany, 62,411; Anne Arundel, 39,553; Baltimore, 122,349; Baltimore City, 558,485; Calvert, 10,325; Caroline, 19,216; Carroll, 33,934; Cecil, 23,759; Charles, 16,386; Dorchester, 28,669; Frederick, 52,673; Garrett, 20,105; Harford, 27,965; Howard, 16,106; Kent, 16,957; Montgomery, 32,089; Prince Georges, 36,147; Queen Anne, 16,839; St Marys, 17,030; Somerset, 26,455; Talbot, 19,620; Washington, 49,617; Wicomico, 26,815; Worcester, 21,841

The following cities and towns in Maryland have a population in excess of 5,000:

Annapolis (city), Anne Arundel co, 8,609.
Baltimore (city), Baltimore City, 558,485.
Cambridge (town), Dorchester co, 6,407.
Cumberland (city) Allegany county, 21,839.
Frederick (city), Frederick county, 10,411.
Frostburg (town), Allegany county, 6,028.
Hagerstown (city), Washington co, 16,507.
Salisbury (town), Wicomico county, 6,690.

Massachusetts. Population of the State, 3,366,416. Population by counties Barnstable, 27,542; Berkshire, 105,259; Bristol, 318,573; Dukes, 4,504; Essex, 436,477; Franklin, 43,600; Hampden, 231,369; Hampshire, 63,327; Middlesex, 669,915; Nantucket, 2,962; Norfolk, 187,506; Plymouth, 144,337; Suffolk, 731,388; Worcester, 399,657.

The following cities and towns in Massachusetts have a population in excess of 5,000:

Arlington (town), Middlesex co, 11,187.
Adams (town), Berkshire county, 13,026.
Amesbury (town), Essex county, 9,894.
Amherst (town), Hampshire county, 5,112.
Andover (town), Essex county, 7,301.
Arlington (town), Middlesex county, 11,187.
Athol (town), Worcester county, 8,536.
Attleborough (town), Bristol county, 16,215.
Belmont (town), Middlesex county, 5,542.
Beverly (city), Essex county, 18,650.
Blackstone (town), Worcester co., 5,648.
Boston (city), Suffolk county, 670,585.
Braintree (town), Norfolk county, 8,066.
Bridgewater (town), Plymouth co, 7,688.
Brockton (city), Plymouth county, 56,878.
Brookline (town), Norfolk county, 27,792.
Cambridge (city), Middlesex county, 104,839.
Chelmsford (town), Middlesex co, 5,010.
Chelsea (city), Suffolk county, 32,452.
Chicopee (city), Hampden county, 25,401.
Clinton (town), Worcester county, 13,075.
Concord (town), Middlesex county, 6,421.
Danvers (town), Essex county, 9,407.
Dedham (town), Norfolk county, 9,284.
Easthampton (town), Hampshire co, 8,524.
Easton (town), Bristol county, 5,139.
Everett (city), Middlesex county, 33,484.
Fairhaven (town), Bristol county, 5,122.
Fall River (city), Bristol county, 119,295.
Fitchburg (city), Worcester county, 37,826.
Framingham (town), Middlesex co., 12,948.
Franklin (town), Norfolk county, 5,641.
Gardner (town), Worcester county, 14,699.
Gloucester (city), Essex county, 24,398.
Grafton (town), Worcester county, 5,705.
Great Barrington (town), Berkshire county, 5,926.
Greenfield (town), Franklin county, 10,427.
Haverhill (city), Essex county, 44,115.
Holyoke (city), Hampden county, 57,730.

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Hudson (town), Middlesex county, 6,743.
Hyde Park (town), Norfolk county, 15,507.
Ipswich (town), Essex county, 5,777.
Lawrence (city), Essex county, 85,892.
Leominster (town), Worcester co, 17,580.
Lowell (city), Middlesex county, 106,294.
Lynn (city), Essex county, 89,336.
Malden (city), Middlesex county, 44,404.
Mansfield (town), Bristol county, 5,183.
Marblehead (town), Essex county, 7,338.
Marborough (city), Middlesex co., 14,579.
Maynard (town), Middlesex county, 6,390.
Medford (city), Middlesex county, 23,150.
Melrose (city), Middlesex county, 15,715.
Methuen (town), Essex county, 11,448.
Middleborough (town), Plymouth co., 8,214.
Milford (town), Worcester county, 13,055.
Milton (town), Norfolk county, 7,924.
Montague (town), Franklin county, 6,866.
Natick (town), Middlesex county, 9,866.
Needham (town), Norfolk county, 5,026.
New Bedford (city), Bristol county, 96,652.
Newburyport (city), Essex county, 14,949.
Newton (city), Middlesex county, 39,806.
North Adams (city), Berkshire county, 22,01.
North Andover (town), Essex county, 5,529.
North Attleborough (town), Bristol county, 9,562.

Northampton (city), Hampshire co., 19,4.
Northbridge (town), Worcester county, 8,80.
Norwood (town), Norfolk county, 8,014.
Orange (town), Franklin county, 5,282.
Palmer (town), Hampden county, 8,610.
Peabody (town), Essex county, 15,721.
Pittsfield (city), Berkshire county, 32,121.
Plymouth (town), Plymouth co, 12,141.
Quincy (city), Norfolk county, 32,642.
Reading (town), Middlesex co., 5,818.
Revere (town), Suffolk county, 18,219.
Rockland (town), Plymouth co, 6,928.
Salem (city), Essex county, 43,697.
Saugus (town), Essex county, 8,047.
Somerville (city), Middlesex co., 77,236.
Southbridge (town), Worcester co., 12,592.
Spencer (town), Worcester county, 6,740.
Springfield (city), Hampton county, 88,926.
Stoneham (town), Middlesex county, 7,090.
Stoughton (town), Norfolk county, 6,316.
Swampscott (town), Essex county, 6,204.
Taunton (city), Bristol county, 34,259.
Wakefield (town), Middlesex county, 11,404.
Waltham (city), Middlesex county, 27,834.
Ware (town), Hampshire county, 8,774.
Watertown (town), Middlesex co., 12,875.
Webster (town), Worcester county, 11,509.
Wellsley (town), Norfolk county, 5,413.
West Springfield (town), Hampden county, 9,224.

Westborough (town), Worcester co., 5,446.
Westfield (town), Hampden co, 16,044.
Weymouth (town), Norfolk county, 12,895.
Whitman (town), Plymouth county, 7,292.
Winchendon (town), Worcester co, 5,678.
Winchester (town), Middlesex co., 9,309.
Winthrop (town), Suffolk county, 10,132.
Woburn (city), Middlesex county, 15,308.
Worcester (city), Worcester co, 145,986.

Michigan. Population of State, 2,810,173. Population by counties: Alcona, 5,703; Alger, 7,675; Allegan, 39,819; Alpena, 19,965; Antrim, 15,692; Arenac, 9,640; Baraga, 6,127; Barry, 22,633; Bay, 68,238; Benzie, 10,638; Berrien, 53,622; Branch, 25,605; Calhoun, 56,638; Cass,

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20,624; Charlevoix, 19,157; Cheboygan, 17,872; Chippewa, 24,472; Clare, 9,240; Clinton, 23,129; Crawford, 3,934; Delta, 30,108; Dickinson, 20,524; Eaton, 30,499; Emmet, 18,561; Genesee, 64,555; Gladwin, 8,413; Gogebic, 23,333; Grand Traverse, 23,784; Gratiot, 28,820; Hillsdale, 29,673; Houghton, 88,098; Huron, 34,758; Ingram, 53,310; Ionia, 33,550; Iosco, 9,753; Iron, 15,164; Isabella, 23,029; Jackson, 53,426; Kalamazoo, 60,427; Kalkaska, 8,097; Kent, 159,145; Keweenaw, 7,158; Lake, 4,939; Lapeer, 26,033; Leelanau, 10,608; Lenawee, 47,907; Livingston, 17,736; Luce, 4,004; Mackinac, 9,249; Macomb, 32,606; Manistee, 26,688; Marquette, 46,739; Mason, 21,832; Mecosta, 19,466; Menominee, 25,648; Midland, 14,005; Missaukee, 10,606; Monroe, 32,917; Montcalm, 32,069; Montmorency, 3,755; Muskegon, 40,577; Newaygo, 19,220; Oakland, 40,576; Oceana, 18,379; Ogemaw, 8,907; Ontonagon, 8,650; Osceola, 17,889; Oscoda, 2,027; Ostego, 6,552; Ottawa, 45,301; Presque Isle, 11,249; Roscommon, 2,274; Saginaw, 89,290; St. Clair, 52,341; St. Joseph, 25,499; Sanilac, 33,930; Schoolcraft, 8,681; Shiawassee, 33,246; Tuscola, 34,913; Van Buren, 33,185; Washtenaw, 44,714; Wayne, 531,591; Wexford, 20,769.

The following cities and villages in Michigan have a population in excess of 5,000.

Adrian (city), Lenawee county, 10,763
 Albion (city), Calhoun county, 5,833
 Alpena (city), Alpena county, 12,706
 Ann Arbor (city), Washtenaw co., 14,817
 Battle Creek (city), Calhoun co., 25,207
 Bay City (city), Bay county, 45,166
 Benton Harbor (city), Berrien co., 9,185
 Boyne City (city), Charlevoix co., 5,218
 Cadillac (city), Wexford county, 8,375
 Cheboygan (city), Cheboygan co., 6,859
 Coldwater (city), Branch county, 5,945
 Detroit (city), Wayne county, 465,766
 Dowagiac (city), Cass county, 5,088
 Escanaba (city), Delta county, 13,194
 Flint (city), Genesee county, 38,550
 Grand Haven (city), Ottawa co., 5,856
 Grand Rapids (city), Kent county, 112,571
 Hancock (city), Houghton county, 8,981
 Hillsdale (city), Hillsdale county, 5,001
 Holland (city), Ottawa county, 10,490
 Houghton (village), Houghton co., 5,113
 Ionia (city), Ionia county, 5,030
 Iron Mountain (city), Dickinson co., 9,216
 Ironwood (city), Gogebic county, 12,821
 Ishpeming (city), Marquette co., 12,448
 Jackson (city), Jackson county, 31,433
 Kalamazoo (city), Kalamazoo co., 39,437
 Lansing (city), Ingram county, 31,229
 Laurium (village), Houghton co., 8,537
 Ludington (city), Mason county, 9,132
 Manistee (city), Manistee co., 12,381
 Marquette (city), Marquette co., 11,503
 Menominee (city), Menominee co., 10,507
 Monroe (city), Monroe county, 6,893
 Mt. Clemens (city), Macomb county, 7,707
 Muskegon (city), Muskegon county, 24,062
 Nagaunee (city), Marquette co., 8,460
 Niles (city), Berrien county, 5,156
 Owosso (city), Shiawassee county, 9,639
 Pontiac (city), Oakland county, 14,532
 Port Huron (city), St. Clair co., 18,863
 Saginaw (city), Saginaw county, 50,510
 St. Joseph (city), Berrien county, 5,936
 Sault Ste. Marie (city), Chippewa county, 12,615.

Three Rivers (city), St. Joseph co., 5,072
 Traverse City (city), Grand Traverse county, 12,115
 Wyandotte (city), Wayne county, 8,287
 Ypsilanti (city), Washtenaw county, 0,230

Minnesota. Population of State, 2,075,708, Indians not taxed, 1,332. Population by counties Aitkin, 10,371; Anoka, 12,493; Becker, 18,840; Beltrami, 19,337; Benton, 11,015; Big Stone, 9,367; Blue Earth, 29,337; Brown, 20,134; Carlton, 17,559; Carver, 17,455; Cass, 11,620; Chippewa, 13,458; Chisago, 13,537; Clay, 19,640; Clearwater, 6,870; Cook, 1,336; Cottonwood, 12,651; Crow Wing, 16,861; Dakota, 25,171; Dodge, 12,094; Douglas, 17,669; Faribault, 19,949; Fillmore, 25,680; Freeborn, 22,282; Goodhue, 31,637; Grant, 9,114; Hennepin, 333,480; Houston, 14,297; Hubbard, 9,831; Isanti, 12,615; Itasca, 17,208; Jackson, 14,491; Kanabec, 6,461; Kandiyohi, 18,069; Kittson, 9,669; Koochiching, 6,431; Lac qui Parle, 15,435; Lake, 8,011; Le Sueur, 18,609; Lincoln, 9,874; Lyon, 15,722; McLeod, 18,691; Mahanomen, 3,249; Marshall, 16,338; Martin, 17,518; Meeker, 17,022; Mille Lacs, 10,705; Morrison, 24,053; Mower, 22,640; Murray, 11,755; Nicollet, 14,125; Nobles, 15,210; Norman, 13,446; Olmsted, 22,497; Otter Tail, 46,036; Pine, 15,878; Pipestone, 9,553; Polk, 36,001; Pope, 12,746; Ramsey, 223,675; Red Lake, 15,940; Redwood, 18,425; Renville, 23,123; Rice, 25,911; Rock, 10,222; Roseau, 11,338; St. Louis, 163,274; Scott, 14,888; Sherbourne, 8,136; Sibley, 15,540; Stearns, 47,733; Steele, 16,146; Stevens, 8,293; Swift, 12,949; Todd, 23,407; Traverse, 8,049; Wabasha, 18,554; Wadena, 8,652; Waseca, 13,466; Washington, 26,013; Watonwan, 11,382; Wilkin, 9,063; Winona, 33,398; Wright, 28,082; Yellow Medicine, 15,406.

The following cities and villages in Minnesota have a population in excess of 5,000:

Albert Lea (city), Freeborn county, 6,192
 Austin (city), Mower county, 6,960
 Bemidji (city), Beltrami county, 5,099
 Brainerd (city), Crow Wing county, 8,526
 Chisholm (village), St. Louis county, 7,684
 Cloquet (city), Carlton county, 7,031
 Crookston (city), Polk county, 7,559
 Duluth (city), St. Louis county, 78,466
 Faribault (city), Rice county, 9,001
 Fergus Falls (city), Otter Tail county, 6,887
 Hibbing (village), St. Louis county, 8,832
 Little Falls (city), Morrison county, 6,078
 Manketo (city), Blue Earth county, 10,365
 Minneapolis (city), Hennepin co., 301,408
 New Ulm (city), Brown county, 5,648
 Owatonna (city), Steele county, 5,658
 Red Wing (city), Goodhue county, 9,048
 Rochester (city), Olmsted county, 7,844
 St. Cloud (city), Benton, Sherbourne and Stearns counties, 10,600
 St. Paul (city), Ramsey county, 214,744
 Stillwater (city), Washington county, 10,198
 Virginia (city), St. Louis county, 10,473
 Winona (city), Winona county, 18,583

Mississippi. Population of State, 1,797,114. Population by counties Adams, 25,205; Alcorn, 18,159; Amite, 22,954; Attala, 28,851; Benton, 10,245; Bolivar, 48,905; Calhoun, 17,726; Carroll, 23,139; Chickasaw, 22,846; Choctaw, 14,357; Claiborne, 17,403; Clarke, 21,630; Clay, 20,203; Coahoma, 34,217; Copiah, 35,914; Covington, 16,909; De Soto, 23,130; Forrest, 20,722; Franklin, 15,193; George, 6,599; Greene, 6,050; Gren-

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ada, 11,207; Hancock, 11,207; Harrison, 34,658; Hinds, 63,726; Holmes, 39,088; Issaquena, 10,560; Itawamba, 14,526; Jackson, 15,451; Jasper, 18,498; Jefferson, 18,221; Jefferson Davis, 12,860; Jones, 29,885; Kemper, 20,348; Lafayette, 21,883; Lamar, 11,741; Lauderdale, 46,919; Lawrence, 13,080; Leae, 18,298; Lee, 28,894; Leflore, 36,290; Lincoln, 28,597; Lowndes, 30,703; Madison, 33,505; Marion, 15,599; Marshall, 26,796; Monroe, 35,178; Montgomery, 17,706; Neshoba, 17,980; Newton, 23,085; Noxubee, 32,503; Oktibeha, 19,676; Panola, 31,274; Pearl River, 10,503; Perry, 7,685; Pike, 37,272; Pontotoc, 19,688; Prentiss, 16,931; Quitman, 11,593; Rankin, 23,944; Scott, 16,723; Sharkey, 15,604; Simpson, 17,201; Smith, 16,603; Sunflower, 28,787; Tallahatchie, 29,078; Tate, 19,714; Tippah, 14,631; Tishomingo, 13,067; Tunica, 18,646; Union, 18,997; Warren, 37,488; Washington, 48,933; Wayne, 14,709; Webster, 14,853; Wilkinson, 18,075; Winston, 17,139; Yalobusha, 21,519; Yazoo, 46,672

The following cities in Mississippi have a population in excess of 5,000

Biloxi, Harrison county, 7,988.
Brookhaven, Lincoln county, 5,293
Columbus, Lowndes county, 8,988
Corinth, Alcorn county, 5,020
Greenville, Washington county, 9,610.
Greenwood, Leflore county, 5,836.
Gulfport, Harrison county, 6,386
Hattiesburg, Forrest county, 11,733.
Jackson, Hinds county, 21,262
Laurel, Jones county, 8,465.
McComb, Pike county, 6,237.
Meridian, Lauderdale county, 23,285.
Natchez, Adams county, 11,791
Vicksburg, Warren county, 20,814.
Yazoo, Yazoo county, 6,796.

Missouri. Population of the State, 3,293,335. Population by counties. Adair, 22,700; Andrew, 15,282; Atchison, 13,604; Audrain, 21,687; Barry, 23,869; Barton, 16,747; Bates, 25,869; Benton, 14,881; Bollinger, 14,576; Boone, 30,533; Buchanan, 93,020; Butler, 20,624; Caldwell, 14,605; Callaway, 24,400; Camden, 11,582; Cape Girardeau, 27,621; Carroll, 23,098; Carter, 5,504; Cass, 22,973; Cedar, 16,080; Chariton, 23,503; Christian, 15,832; Clark, 12,811; Clay, 20,302; Clinton, 15,297; Cole, 21,957; Cooper, 20,311; Crawford, 13,576; Dade, 15,613; Dallas, 13,181; Daviess, 17,605; Dekalb, 12,531; Dent, 13,245; Douglas, 16,664; Dunklin, 30,328; Franklin, 29,830; Gasconade, 12,847; Gentry, 16,820; Greene, 63,831; Grundy, 16,744; Harrison, 20,466; Henry, 27,242; Hickory, 8,741; Holt, 14,539; Howard, 15,653; Howell, 21,065; Iron, 8,563; Jackson, 283,522; Jasper, 89,673; Jefferson, 27,878; Johnson, 20,297; Knox, 12,403; Laclede, 17,363; Lafayette, 30,154; Lawrence, 26,583; Lewis, 15,514; Lincoln, 17,033; Linn, 25,253; Livingston, 19,453; McDonald, 13,539; Macon, 30,868; Madison, 11,273; Maries, 10,088; Marion, 30,572; Mercer, 12,335; Miller, 16,717; Mississippi, 14,557; Moniteau, 14,375; Monroe, 18,304; Montgomery, 15,604; Morgan, 12,863; New Madrid, 19,488; Newton, 27,136; Nodaway, 28,833; Oregon, 14,681; Osage, 14,283; Ozark, 11,926; Pemiscot, 19,559; Perry, 14,898; Pettis, 33,913; Phelps, 15,796; Pike, 22,556; Platte, 14,429; Polk, 21,561; Pulaski, 11,438; Putnam, 14,308; Ralls, 12,913; Randolph, 26,182; Ray, 21,451; Reynolds, 9,592; Ripley, 13,099; St Charles, 24,695; St. Clair, 16,412; St. Francois, 35,738;

St Louis, 82,417; St Louis City, 687,029; Ste. Genevieve, 10,607; Saline, 29,448; Schuyler, 9,062; Scotland, 11,869; Scott, 22,372; Shannon, 11,443; Shelby, 14,864; Stoddard, 27,807; Stone, 11,559; Sullivan, 18,598; Taney, 9,134; Texas, 21,458; Vernon, 28,827; Warren, 9,123; Washington, 13,378; Wayne, 15,181; Webster, 17,377; Worth, 8,007; Wright, 18,315.

The following cities in Missouri have a population in excess of 5,000

Brookfield, Linn county, 5,749.
Cape Girardeau, Cape Girardeau co., 8,475
Carthage, Jasper county, 9,483
Chillicothe, Livingston county, 6,265
Columbia, Boone county, 9,662
Flat River, St Francois county, 5,112.
Fulton, Callaway county, 5,228.
Hannibal, Marion county, 18,341
Independence, Jackson county, 9,859
Jefferson City, Cole county, 11,850
Joplin, Jasper county, 32,073
Kansas City, Jackson county, 248,381.
Kirksville, Adair county, 6,347
Lexington, Lafayette county, 5,242.
Mexico, Audrain county, 5,939
Moberly, Randolph county, 10,923.
Nevada, Vernon county, 7,176
Poplar Bluff, Butler county, 6,916.
St Charles, St Charles county, 9,437.
St Joseph, Buchanan county, 77,403
St Louis, St Louis county, 687,029.
Sedalia, Pettis county, 17,822.
Springfield, Greene county, 35,201
Trenton, Grundy county, 5,656
Webb City, Jasper county, 11,817.
Webster Groves, St Louis county, 7,080.
Wellston, St. Louis county, 7,312

Montana. Population of the State, 376,053; Indians not taxed, 9,715. Population by counties: Beaverhead, 6,446; Broadwater, 3,491; Carbon, 13,962; Cascade, 28,833; Chouteau, 17,191; Custer, 14,123; Dawson, 12,725; Deer Lodge, 12,988; Fergus, 17,385; Flathead, 18,785; Gallatin, 14,079; Granite, 2,942; Jefferson, 5,601; Lewis and Clark, 21,853; Lincoln, 3,638; Madison, 7,229; Meagher, 4,190; Missoula, 23,596; Park, 10,731; Powell, 5,904; Ravalli, 11,666; Rosebud, 7,985; Sanders, 3,713; Silver Bow, 56,848; Sweet Grass, 4,029; Teton, 9,546; Valley, 13,630; Yellowstone, 22,944

The following cities in Montana have a population in excess of 5,000

Anaconda, Deer Lodge county, 10,134.
Billings, Yellowstone county, 10,031
Bozeman, Gallatin county, 5,107.
Butte, Silver Bow county, 39,165.
Great Falls, Cascade county, 13,948
Helena, Lewis and Clark county, 12,515.
Kalispel, Flathead county, 5,549.
Livingston, Park county, 5,357
Missoula, Missoula county, 12,869

Nebraska. Population of the State, 1,192,214. Population by counties: Adams, 20,900; Antelope, 14,003; Banner, 1,444; Blaine, 1,672; Boone, 13,145; Boxbutte, 6,131; Boyd, 8,826; Brown, 6,083; Buffalo, 21,907; Burt, 12,726; Butler, 15,403; Cass, 19,786; Cedar, 15,191; Chase, 3,615; Cherry, 10,414; Cheyenne, 4,551; Clay, 15,720; Colfax, 11,610; Cuming, 13,782; Custer, 25,668; Dakota, 6,564; Dawes, 8,254; Dawson, 15,961; Deuel, 1,786; Dixon, 11,477; Dodge, 22,145; Douglas, 168,546; Dundy, 4,098; Fillmore, 10,674; Franklin, 10,303; Frontier,

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8,572; Furnas, 12,083; Gage, 30,325; Garden, 3,538; Garfield, 3,417; Gosper, 4,933; Grant, 1,097; Greeley, 8,047; Hall, 20,361; Hamilton, 13,459; Harlan, 9,578; Hayes, 3,011; Hitchcock, 5,415; Holt, 15,545; Hooker, 981; Howard, 10,783; Jefferson, 10,852; Johnson, 10,187; Kearney, 9,106; Keith, 3,692; Keyapaha, 3,452; Kimball, 1,942; Knox, 18,358; Lancaster, 73,793; Lincoln, 15,684; Logan, 1,521; Loup, 2,188; McPherson, 2,470; Madison, 19,101; Merrick, 10,379; Morrill, 4,584; Nance, 8,926; Nemaha, 13,095; Nuckolls, 13,019; Otoe, 19,323; Pawnee, 10,582; Perkins, 2,570; Phelps, 10,451; Pierce, 10,122; Platte, 19,006; Polk, 10,521; Redwillow, 11,056; Richardson, 17,448; Rock, 3,627; Saline, 17,866; Sarpy, 9,274; Saunders, 21,179; Scotts Bluff, 8,355; Seward, 15,895; Sheridan, 7,328; Sherman, 8,278; Sioux, 5,599; Stanton, 7,542; Thayer, 14,775; Thomas, 1,191; Thurston, 8,704; Valley, 9,480; Washington, 12,738; Wayne, 10,397; Webster, 12,008; Wheeler, 2,292; York, 18,721.

The following cities in Nebraska have a population in excess of 5,000.

Beatrice, Gage county, 9,356.
Columbus, Platte county, 5,014.
Fairbury, Jefferson county, 5,294.
Fremont, Dodge county, 8,718.
Grand Island, Hall county, 10,326.
Hastings, Adams county, 9,338.
Kearney, Buffalo county, 6,202.
Lincoln, Lancaster county, 43,973.
Nebraska City, Otoe county, 5,488.
Norfolk, Madison county, 6,025.
Omaha, Douglas county, 124,096.
South Omaha, Douglas county, 26,259.
York, York county, 6,235.

Nevada. Population of the State, 81,875; Indians not taxed, 1,582. Population by counties: Churchill, 2,811; Clark, 3,321; Douglas, 1,895; Elko, 8,133; Esmeralda, 9,695; Eureka, 1,830; Humboldt, 6,825; Lander, 1,786; Lincoln, 3,489; Lyon, 3,568; Nye, 7,513; Ormsby, 3,089; Storey, 3,045; Washoe, 17,434; White Pine, 7,441.

Reno, Washoe county, Nevada has a population of 10,867.

New Hampshire. Population of the State, 430,572. Population by counties: Belknap, 21,309; Carroll, 16,316; Cheshire, 30,659; Coos, 30,753; Grafton, 41,652; Hillsboro, 126,072; Merrimack, 53,335; Rockingham, 52,188; Strafford, 39,951; Sullivan, 19,337.

The following cities and towns in New Hampshire have a population in excess of 5,000.

Berlin (city), Coos county, 11,780.
Claremont (town), Sullivan county, 7,529.
Concord (city), Merrimack county, 21,497.
Derry (town), Rockingham county, 5,123.
Dover (city), Strafford county, 13,247.
Franklin (city), Merrimack county, 6,132.
Keene (city), Cheshire county, 10,068.
Laconia (city), Belknap county, 10,183.
Lebanon (town), Grafton county, 5,718.
Manchester (city), Hillsboro county, 70,063.
Nashua (city), Hillsboro county, 26,005.
Portsmouth (city), Rockingham co., 11,269.
Rochester (city), Strafford county, 8,868.
Somersworth (city), Strafford county, 6,704.

New Jersey. Population of the State, 2,537,167. Population by counties: Atlantic, 71,894; Bergen, 138,002; Burlington, 66,565; Camden,

142,029; Cape May, 19,745; Cumberland, 55,153; Essex, 512,886; Gloucester, 37,368; Hudson, 537,231; Hunterdon, 33,569; Mercer, 125,657; Middlesex, 114,426; Monmouth, 94,734; Morris, 74,704; Ocean, 21,318; Passaic, 215,902; Salem, 20,999; Somerset, 38,820; Sussex, 20,781; Union, 140,197; Warren, 43,187.

The following cities, towns, villages, and boroughs in New Jersey have a population in excess of 5,000.

Asbury Park (city), Monmouth co., 10,150.
Atlantic City (city), Atlantic county, 46,150.
Bayonne (city), Hudson county, 55,545.
Bloomfield (town), Essex county, 15,070.
Bridgeton (city), Cumberland county, 14,209.
Burlington (city), Burlington county, 8,336.
Camden (city), Camden county, 94,538.
Dover (town), Morris county, 7,468.
East Orange (city), Essex county, 34,371.
Elizabeth (city), Union county, 73,409.
Englewood (city), Bergen county, 9,924.
Garfield (borough), Bergen county, 10,213.
Gloucester (city), Camden county, 9,462.
Guttenberg (town), Hudson county, 5,647.
Hackensack (town), Bergen county, 14,050.
Hammonton (town), Atlantic county, 5,088.
Harrison (town), Hudson county, 14,498.
Hoboken (city), Hudson county, 70,324.
Irvington (town), Essex county, 11,877.
Jersey City (city), Hudson county, 267,779.
Kearney (town), Hudson county, 18,659.
Long Branch (city), Monmouth co., 13,298.
Millville (city), Cumberland county, 12,451.
Montclair (town), Essex county, 21,550.
Morristown (town), Morris county, 12,507.
Newark (city), Essex county, 347,469.
New Brunswick (city), Middlesex co., 23,388.
North Plainfield (borough), Somerset county, 6,117.
Nutley (town), Essex county, 6,009.
Orange (city), Essex county, 29,630.
Passaic (city), Passaic county, 54,773.
Paterson (city), Passaic county, 125,600.
Perth Amboy (city), Middlesex co., 32,121.
Phillipsburg (town), Warren county, 13,903.
Plainfield (city), Union county, 20,550.
Princeton (borough), Mercer county, 5,136.
Rahway (city), Union county, 9,337.
Red Bank (borough), Monmouth co., 7,398.
Ridgewood (village), Bergen county, 5,416.
Roosevelt, (borough), Middlesex co., 5,786.
Rutherford (borough), Bergen co., 7,045.
Salem (city), Salem county, 6,614.
Somerville (borough), Somerset co., 5,060.
South Amboy (city), Middlesex co., 7,007.
South Orange (village), Essex county, 6,014.
Summit (city), Union county, 7,500.
Trenton (city), Mercer county, 98,815.
Union (town), Hudson county, 21,023.
Vineland (borough), Cumberland co., 5,282.
Westfield (town), Union county, 6,420.
West Hoboken (town), Hudson co., 35,403.
West New York, (town), Hudson county, 13,560.
West Orange (town), Essex county, 10,980.

New Mexico. Population of State, 327,396. Population by counties: Bernalillo, 23,606; Chaves, 16,850; Colfax, 16,460; Curry, 11,443; Dona Ana, 12,893; Eddy, 12,400; Grant, 14,813; Guadalupe, 10,927; Lincoln, 7,822; Luna, 3,913; McKinley, 12,063; Mora, 12,611; Otero, 7,069; Quay, 14,912; Rio Arriba, 16,719; Roosevelt, 12,064; San Juan, 8,504; San Miguel, 22,940; Sandoval, 8,579; Santa Fe, 14,770; Sierra,

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3,536; Socorro, 14,761; Taos, 12,008; Torrance, 10,119; Union, 11,404, Valencia, 13,320

The following cities in New Mexico have a population in excess of 5,000

Albuquerque, Bernalillo county, 11,020.

Roswell, Chaves county, 6,172

Santa Fe, Santa Fe county, 5,072.

New York. Population of State, 9,113,279
Indians not taxed, 4,680 Population by counties Albany, 173,666; Allegany, 41,412; Broome, 78,809; Cattaraugus, 65,910; Cayuga, 67,106; Chautauqua, 105,126; Chemung, 54,662; Chenango, 35,575; Clinton, 48,230; Columbia, 43,658; Cortland, 29,249; Delaware, 45,575; Dutchess, 87,661; Erie, 528,985; Essex, 33,458; Franklin, 45,717; Fulton, 44,534; Genesee, 37,615; Greene, 30,214; Hamilton, 4,373; Herkimer, 50,356; Jefferson, 80,297; Kings, 1,034,351; Lewis, 24,849; Livingston, 38,037; Madison, 39,289; Monroe, 283,212; Montgomery, 57,567; Nassau, 83,930; New York, 2,762,522; Niagara, 92,036; Oneida, 154,157; Onondaga, 200,298; Ontario, 52,286; Orange, 115,751; Orleans, 32,000; Oswego, 71,664; Otsego, 47,216; Putnam, 14,665; Queens, 284,041; Rensselaer, 122,276; Richmond, 85,069; Rockland, 46,873; St Lawrence, 89,005; Saratoga, 61,917; Schenectady, 88,235; Schoharie, 23,855; Schuyler, 14,004; Seneca, 26,972; Steuben, 83,362; Suffolk, 96,138; Sullivan, 33,808; Tioga, 25,624; Tompkins, 33,647; Ulster, 91,769; Warren, 32,223; Washington, 47,778; Wayne, 50,179; Westchester, 283,055; Wyoming, 31,880; Yates, 18,642.

The following cities and villages in New York have a population in excess of 5,000:

Albany (city), Albany county, 100,253

Albion (village), Orleans county, 5,016.

Amsterdam (city), Montgomery co, 31,267.

Auburn (city), Cayuga county, 34,668.

Batavia (village), Genesee county, 11,613.

Binghamton (city), Broome county, 48,443.

Buffalo (city), Erie county, 423,714

Canandaigua (village), Ontario co, 7,217.

Catskill (village), Greene county, 5,296.

Cohoes (city), Albany county, 24,709.

Corning (city), Steuben county, 13,730

Cortland (city), Cortland county, 11,504

Dunkirk (city), Chautauqua county, 17,221.

Elmira (city), Chemung county, 37,176.

Fredonia (village), Chautauqua co, 5,285.

Fulton (city), Oswego county, 10,480.

Geneva (city), Ontario county, 12,446.

Glen Falls (city), Warren county, 15,243.

Gloversville (city), Fulton county, 20,642.

Haverstraw (village), Rockland co, 5,669.

Herkimer (village), Herkimer county, 7,520.

Hoosick Falls (village), Rensselaer county, 5,532.

Hornell (city), Steuben county, 13,617.

Hudson (city), Columbia county, 11,417.

Hudson Falls (village), Washington county, 5,189.

Ilion (village), Herkimer county, 6,588.

Ithaca (city), Tompkins county, 14,802.

Jamestown (city), Chautauqua co, 31,297.

Johnstown (city), Fulton county, 10,447.

Kingston (city), Ulster county, 25,908.

Lackawanna (city), Erie county, 14,549

Little Falls (city), Herkimer county, 12,273.

Lockport (city), Niagara county, 17,970

Malone (village), Franklin county, 6,467.

Mamaroneck (village), Westchester county, 5,699.

Matteawan (village), Dutchess co, 6,727.

Mechanicville (village), Saratoga county, 6,634.

Medina (village), Orleans county, 5,683

Middletown (city), Orange county, 15,313.

Mount Vernon (city), Westchester county, 30,919

New Rochelle (city), Westchester co, 28,867.

New York City:

Manhattan (borough), New York county, 2,331,542.

Bronx (borough), New York co, 430,980

Brooklyn (borough), Kings co, 1,634,351.

Richmond (borough), Richmond county, 85,969.

Queens (borough), Queens co, 284,041.

Total, New York City, 4,766,883.

Newark (village), Wayne county, 6,227

Newburgh (city), Orange county, 27,805.

Niagara Falls (city), Niagara co, 30,445.

North Tarrytown (village), Westchester county, 5,421.

North Tonawanda (city), Niagara county, 11,955.

Norwich (village), Chenango co, 7,422.

Ogdensburg (city), St. Lawrence co, 15,933

Olean (city), Cattaraugus co, 14,743.

Oneida (city), Madison county, 8,317

Oneonta (city), Otsego county, 9,491.

Ossining (village), Westchester co, 11,480

Oswego (city), Oswego county, 23,368

Peekskill (village), Westchester co, 15,245

Plattsburg (city), Clinton county, 11,138.

Port Chester (village), Westchester county, 12,809.

Port Jervis (city), Orange county, 9,564

Poughkeepsie (city), Dutchess co., 27,936.

Rensselaer (city), Rensselaer county, 10,711.

Rochester (city), Monroe county, 218,149

Rome (city), Oneida county, 20,497.

Salamanca (village), Cattaraugus co., 5,792

Saratoga Springs (village), Saratoga county, 12,693

Schenectady (city), Schenectady co, 72,826

Seneca Falls (village), Seneca county, 6,588.

Solvay (village), Onondaga county, 5,139.

Syracuse (city), Onondaga county, 137,249.

Tarrytown (village), Westchester co, 5,600.

Tonawanda (city), Erie county, 8,290

Troy (city), Rensselaer county, 76,813.

Utica (city), Oneida county, 74,419.

Watertown (city), Jefferson county, 26,730.

Watervliet (city), Albany county, 15,074.

White Plains (village), Westchester county, 15,949.

Yonkers (city), Westchester county, 79,803.

North Carolina. Population of State,

2,206,287. Population by counties Alamance,

28,712; Alexander, 11,592; Alleghany, 7,745;

Anson, 25,465; Ashe, 19,074; Beaufort, 30,877;

Bertie, 23,039; Bladen, 18,006; Brunswick, 14,

432; Buncombe, 49,798; Burke, 21,408; Cabar-

rus, 26,240; Caldwell, 20,579; Camden, 5,640;

Carteret, 13,776; Caswell, 14,858; Catawba, 27,

918; Chatham, 22,635; Cherokee, 14,136; Chowan,

11,303; Clay, 3,909; Cleveland, 29,494; Colum-

bus, 28,020; Craven, 25,594; Cumberland, 35,284;

Currituck, 7,693; Dare, 4,841; Davidson, 29,404;

Davie, 13,394; Duplin, 25,442; Durham, 35,276;

Edgecombe, 32,010; Forsyth, 47,311; Franklin,

24,692; Gaston, 37,063; Gates, 10,455; Graham,

4,749; Granville, 25,102; Greene, 13,083; Guil-

ford, 60,497; Halifax, 37,646; Harnett, 22,174;

Haywood, 21,020; Henderson, 16,262; Hertford,

15,436; Hyde, 8,840; Iredell, 34,315; Jackson,

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12,998; Johnston, 41,401; Jones, 8,721; Lee, 11,376; Lenoir, 22,769; Lincoln, 17,132; McDowell, 13,538; Macon, 12,191; Madison, 20,132; Martin, 17,797; Mecklenburg, 67,031; Mitchell, 17,245; Montgomery, 14,967; Moore, 17,010; Nash, 33,727; New Hanover, 32,037; Northampton, 22,323; Onslow, 14,125; Orange, 15,064; Pamlico, 9,966; Pasquotank, 16,693; Pender, 15,471; Perquimans, 11,054; Person, 17,356; Pitt, 36,340; Polk, 7,640; Randolph, 29,491; Richmond, 19,673; Robeson, 51,945; Rockingham, 36,442; Rowan, 37,521; Rutherford, 28,385; Sampson, 20,982; Scotland, 15,363; Stanley, 19,909; Stokes, 20,151; Surry, 29,705; Swain, 10,403; Transylvania, 7,191; Tyrrell, 5,219; Union, 33,277; Vance, 19,425; Wake, 63,229; Warren, 20,266; Washington, 11,062; Watauga, 13,556; Wayne, 35,698; Wilkes, 30,282; Wilson, 28,269; Yadkin, 15,428; Yancey, 12,072.

The following cities and towns in North Carolina have a population in excess of 5,000: Asheville (city), Buncombe county, 18,762. Charlotte (city), Mecklenburg co., 34,014. Concord (city), Cabarrus county, 8,715. Durham (city), Durham county, 18,241. Elizabeth (city), Pasquotank county, 8,412. Fayetteville (town), Cumberland co., 7,045. Gastonia (town), Gaston county, 5,759. Goldsboro (city), Wayne county, 6,107. Greensboro (city), Guilford county, 15,895. High Point (city), Guilford county, 9,525. Kinston (town), Lenoir county, 6,995. Newberne (city), Craven county, 9,961. Raleigh (city), Wake county, 19,218. Rocky Mount (town), Edgecombe and Nash counties, 8,051. Salem (town), Forsyth county, 5,533. Salisbury (city), Rowan county, 7,153. Washington (town), Beaufort county, 6,211. Wilmington (city), New Hanover co., 25,748. Wilson (town), Wilson county, 6,717. Winston (city), Forsyth county, 17,167.

North Dakota. Population of State, 577,056; Indians not taxed, 2,653. Population by counties Adams, 5,407; Barnes, 18,066; Benson, 12,681; Billings, 10,186; Bottineau, 17,295; Bowman, 4,668; Burleigh, 13,087; Cass, 33,935; Cavalier, 15,659; Dickey, 9,839; Dunn, 5,302; Eddy, 4,800; Emmons, 9,769; Foster, 5,313; Grand Forks, 27,888; Griggs, 6,274; Hettinger, 6,557; Kidder, 5,962; Lamoure, 10,724; Logan, 6,168; McHenry, 17,627; McIntosh, 7,251; McKenzie, 5,720; McLean, 14,578; Mercer, 4,665; Mountrail, 8,491; Morton, 25,289; Nelson, 10,140; Oliver, 3,577; Pembina, 14,749; Pierce, 9,740; Ramsey, 15,199; Ransom, 10,345; Richland, 19,659; Rolette, 9,558; Sargent, 9,202; Sheridan, 8,103; Stark, 12,504; Steele, 7,616; Stutsman, 18,189; Towner, 8,953; Traill, 12,545; Walsh, 19,491; Ward, 42,185; Wells, 11,814; Williams, 20,249.

The following cities in North Dakota have a population in excess of 5,000

Bismarck, Burleigh county, 5,443
Devils Lake, Ramsey county, 5,157
 Fargo, Cass county, 14,331.
Grand Forks, Grand Forks county, 12,478.

Ohio. Population of State, 4,767,121. Population by counties Adams, 24,755; Allen, 56,580; Ashland, 22,975; Ashtabula, 59,547; Athens, 47,798; Auglaize, 31,246; Belmont, 76,856; Brown, 24,832; Butler, 70,271; Carroll, 15,761; Champaign, 26,351; Clark, 66,435; Clermont, 29,551; Clinton, 23,680; Columbiana, 76,619; Coshocton, 30,121; Crawford, 34,036; Cuya-

hoga, 637,425; Darke, 42,933; Defiance, 21,498; Delaware, 27,182; Erie, 38,327; Fairfield, 39,201; Fayette, 21,744; Franklin, 221,567; Fulton, 23,914; Gallia, 25,745; Geauga, 14,670; Greene, 29,733; Guernsey, 42,716; Hamilton, 460,732; Hancock, 37,860; Hardin, 30,407; Harrison, 19,076; Henry, 25,119; Highland, 28,711; Hocking, 23,650; Holmes, 17,909; Huron, 34,206; Jackson, 30,791; Jefferson, 65,423; Knox, 30,181; Lake, 22,927; Lawrence, 39,488; Licking, 55,590; Logan, 30,084; Lorain, 76,037; Lucas, 192,728; Madison, 19,902; Mahoning, 116,151; Marion, 33,971; Medina, 23,598; Meigs, 25,594; Mercer, 27,536; Miami, 45,047; Monroe, 24,244; Montgomery, 163,763; Morgan, 16,097; Morrow, 16,815; Muskingum, 57,488; Noble, 18,601; Ottawa, 22,360; Paulding, 22,730; Perry, 35,396; Pickaway, 26,158; Pike, 15,723; Portage, 30,307; Preble, 23,834; Putnam, 29,972; Richland, 47,667; Ross, 40,069; Sandusky, 35,171; Scioto, 48,463; Seneca, 42,421; Shelby, 24,663; Stark, 122,987; Summit, 108,253; Trumbull, 52,766; Tuscarawas, 57,035; Union, 21,871; Van Wert, 29,119; Vinton, 13,096; Warren, 24,497; Washington, 45,422; Wayne, 38,058; Williams, 25,198; Wood, 46,330; Wyandot, 20,760.

The following cities and villages in Ohio have a population in excess of 5,000

Akron (city), Summit county, 60,067
Alliance (city), Stark county, 15,083
Ashland (village), Ashland county, 6,795
Ashtabula (city), Ashtabula county, 18,266
Athens (village), Athens county, 5,463.
Barberton (village), Summit county, 9,410
Bellaire (city), Belmont county, 12,946
Bellefontaine (city), Logan county, 8,238
Bellevue (village), Huron and Sandusky counties, 5,209
Bowling Green (city), Wood county, 5,222.
Bucyrus (city), Crawford county, 8,122
Cambridge (city), Guernsey county, 11,327
Canal Dover (city), Tuscarawas co., 6,621
Canton (city), Stark county, 50,217.
Chillicothe (city), Ross county, 14,508
Cincinnati (city), Hamilton county, 363,591
Circleville (city), Pickaway county, 6,744
Cleveland (city), Cuyahoga county, 560,663.
Columbus (city), Franklin county, 181,511.
Conneaut (city) Ashtabula county, 8,319
Coshocton (city), Coshocton county, 9,603
Dayton (city), Montgomery county, 116,577.
Defiance (city), Defiance county, 7,327
Delaware (city), Delaware county, 9,076
Delphos (village), Allen and Van Wert counties, 5,038
East Cleveland (village), Cuyahoga co., 9,179
East Liverpool (city), Columbiana co., 20,387.
Elyria (city), Lorain county, 14,825
Findley (city), Hancock county, 14,858
Fostoria (city), Hancock and Seneca counties, 9,597
Fremont (city), Sandusky county, 9,939.
Galion (city), Crawford county, 7,214.
Gallipolis (city), Gallia county, 5,560
Greenville (city), Darke county, 6,237.
Hamilton (city), Butler county, 35,279
Ironton (city), Lawrence county, 13,147.
Jackson (village), Jackson county, 5,468.
Kenton (city), Harding county, 7,185.
Lakewood (village), Cuyahoga co., 15,181.
Lancaster (city), Fairfield county, 13,093.
Lima (city), Allen county, 30,508.
Lorain (city), Lorain county, 28,883
Madisonville (village), Hamilton co., 5,193.

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Mansfield (city), Richland county, 20,768.
 Marietta (city), Washington county, 12,923.
 Marion (city), Marion county, 18,232
 Martins Ferry (city), Belmont county, 9,133
 Massillon (city), Stark county, 13,879
 Middletown (city), Butler county, 13,152.
 Mt. Vernon (city), Knox county, 9,087.
 Nelsonville (city), Athens county, 6,082.
 New Philadelphia (city), Tuscarawas county, 8,542
 Newark (city), Licking county, 25,404
 Newburgh (city), Cuyahoga county, 5,813.
 Niles (city), Trumbull county, 8,361.
 Norwalk (city), Huron county, 7,858.
 Norwood (city), Hamilton county, 16,185.
 Painesville (city), Lake county, 5,501
 Piqua (city), Miami county, 13,388
 Portsmouth (city), Scioto county, 23,481.
 Ravenna (village), Portage county, 5,310
 St Bernard (village), Hamilton co., 5,002
 St Mary's (city), Auglaize county, 5,732.
 Salem (city), Columbiana county, 8,943.
 Sandusky (city), Erie county, 19,989
 Sidney (city), Shelby county, 6,607
 Springfield (city), Clark county, 46,921.
 Steubenville (city), Jefferson county, 22,391.
 Tiffin (city), Seneca county, 11,894
 Toledo (city), Lucas county, 168,497.
 Troy (city), Miami county, 6,122
 Urbana (city), Campaign county, 7,739;
 Van Wert (city), Van Wert county, 7,157
 Wapakoneta (village), Auglaize co., 5,349.
 Warren (city), Trumbull county, 11,081
 Washington Court House (city), Fayette county, 7,277.
 Wellston (city), Jackson county, 6,875
 Wellsville (city), Columbiana county, 7,769.
 Wooster (city), Wayne county, 6,136.
 Xenia (city), Greene county, 8,706
 Youngstown (city), Mahoning co., 79,066
 Zanesville (city), Muskingum county, 28,026.

Oklahoma. Population of State, 1,657,155.
 Population by counties Adair, 10,535; Alfalfa, 18,138; Atoka, 13,808; Beaver, 13,631; Beckham, 19,699; Blaine, 17,960; Bryan, 29,854; Caddo, 35,685; Canadian, 23,501; Carter, 25,358; Cherokee, 16,778; Choctaw, 21,862; Cimarron, 4,553; Cleveland, 18,843; Coal, 15,817; Comanche, 41,489; Craig, 17,404; Creek, 26,223; Custer, 23,231; Delaware, 11,469; Dewey, 14,132; Ellis, 15,375; Garfield, 33,050; Garvin, 26,545; Grady, 30,309; Grant, 18,760; Greer, 16,449; Harmon, 11,328; Harper, 8,189; Haskell, 18,875; Hughes, 24,040; Jackson, 23,737; Jefferson, 17,430; Johnston, 16,734; Kay, 26,999; Kingfisher, 18,825; Kiowa, 27,526; Latimer, 11,321; Le Flore, 29,127; Lincoln, 34,779; Logan, 31,740; Love, 10,236; McClain, 15,659; McCurtain, 20,681; McIntosh, 20,961; Major, 15,248; Marshall, 11,619; Mayes, 13,596; Murray, 12,744; Muskogee, 52,743; Noble, 14,945; Nowata, 14,223; Okfuskee, 19,995; Oklahoma, 85,232; Okmulgee, 21,115; Osage, 20,101; Ottawa, 15,713; Pawnee, 17,332; Payne, 23,735; Pittsburg, 47,650; Pontotoc, 24,331; Pottawatomie, 43,595; Pushmataha, 10,118; Roger Mills, 12,861; Rogers, 17,736; Seminole, 19,964; Sequoyah, 25,005; Stephens, 22,252; Texas, 14,249; Tillman, 18,650; Tulsa, 34,905; Wagoner, 22,086; Washington, 17,484; Washita, 25,034; Woods, 17,567; Woodward, 16,592

The following cities in Oklahoma have a population in excess of 5,000:

El Reno, Canadian county, 7,872.
 Shawnee, Pottawatomie county, 12,474.

Oregon. Population of State, 672,765.
 Population by counties Baker, 18,076; Benton, 10,663; Clackamas, 29,931; Clatsop, 16,106; Columbia, 10,580; Coos, 17,959; Crook, 9,315; Curry, 2,044; Douglas, 19,674; Gilliam, 3,701; Grant, 5,607; Harney, 4,059; Hood River, 8,016; Jackson, 25,756; Josephine, 9,567; Klamath, 8,554; Lake, 4,658; Lane, 33,783; Lincoln, 5,587; Linn, 22,662; Malheur, 8,601; Marion, 39,780; Morrow, 4,357; Multnomah, 226,261; Polk, 13,469; Sherman, 4,242; Tillamook, 6,266; Umatilla, 20,309; Union, 16,191; Wallowa, 8,364; Wasco, 16,336; Washington, 21,522; Wheeler, 2,484; Yamhill, 18,285

The following cities in Oregon have a population in excess of 5,000

Ashland, Jackson county, 5,020
 Astoria, Clatsop county, 9,599.
 Baker City, Baker county, 6,742.
 Eugene, Lane county, 9,009
 Medford, Jackson county, 8,840
 Portland, Multnomah county, 207,214.
 Salem, Marion county, 14,094

Pennsylvania. Population of State, 7,665,111. Population by counties. Adams, 34,319; Allegheny, 1,018,463; Armstrong, 67,880; Beaver, 78,353; Bedford, 38,879; Berks, 183,222; Blair, 108,858; Bradford, 54,526; Bucks, 76,530; Butler, 72,689; Cambria, 166,131; Cameron, 7,644; Carbon, 52,846; Center, 43,424; Chester, 109,213; Clarion, 36,638; Clearfield, 93,768; Clinton, 31,545; Columbia, 48,467; Crawford, 61,565; Cumberland, 54,479; Dauphin, 136,152; Delaware, 117,906; Elk, 35,871; Erie, 115,517; Fayette, 167,449; Forest, 9,435; Franklin, 59,775; Fulton, 9,703; Greene, 28,882; Huntingdon, 38,304; Indiana, 66,210; Jefferson, 63,090; Juniata, 15,013; Lackawanna, 259,570; Lancaster, 167,029; Lawrence, 70,032; Lebanon, 59,565; Lehigh, 118,832; Luzerne, 343,186; Lycoming, 80,813; McKean, 47,699; Mercer, 77,699; Mifflin, 27,785; Monroe, 22,941; Montgomery, 169,590; Montour, 14,868; Northampton, 127,667; Northumberland, 111,420; Perry, 24,136; Philadelphia, 1,549,008; Pike, 8,033; Potter, 29,729; Schuylkill, 207,894; Snyder, 16,800; Somerset, 67,717; Sullivan, 11,293; Susquehanna, 37,746; Tioga, 42,829; Union, 16,249; Venango, 50,359; Warren, 39,573; Washington, 143,680; Wayne, 29,236; Westmoreland, 231,304; Wyoming, 15,509; York, 136,405

The following cities, towns and boroughs in Pennsylvania have a population in excess of 5,000:

Allentown (city), Lehigh county, 51,913.
 Altoona (city), Blair county, 52,127.
 Ambridge (borough), Beaver county, 5,205
 Archbald (borough), Lackawanna co., 7,194.
 Ashland (borough), Schuylkill co., 6,855
 Ashley (borough), Luzerne county, 5,601.
 Bangor (borough), Northampton co., 5,369.
 Beaver Falls (borough), Beaver co., 12,191.
 Bellevue (borough), Allegheny county, 6,323
 Berwick (borough), Columbia county, 5,357.
 Bethlehem (borough), Lehigh and Northampton counties, 12,837
 Blakely (borough), Lackawanna co., 5,345.
 Bloomsburg (town), Columbia county, 7,413.
 Braddock (borough), Allegheny co., 19,357.
 Bradford (city), McKean county, 14,544.
 Bristol (borough), Bucks county, 9,256.
 Butler (borough), Butler county, 20,728
 Carbondale (city), Lackawanna co., 17,040.
 Carlisle (borough), Cumberland co., 10,303.

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Carnegie (borough), Allegheny co, 10,009
 Carrick (borough), Allegheny county, 6,117.
 Catasauqua (borough), Lehigh county, 5,250
 Chambersburg (borough), Franklin county, 11,800
 Charleroi (borough), Washington co, 9,615
 Chester (city), Delaware county, 38,537
 Clearfield (borough), Clearfield co, 6,851.
 Coaldale (borough), Schuylkill co, 5,154
 Coatesville (borough), Chester co, 11,084.
 Columbia (borough), Lancaster co, 11,454
 Connellsville (borough), Fayette co, 12,845
 Conshohocken (borough), Montgomery county, 7,480.
 Coraopolis (borough), Allegheny co., 5,252
 Corry (city), Erie county, 5,991
 Danville (borough), Montour county, 7,517.
 Darby (borough), Delaware county, 6,305
 Dickson (borough), Lackawanna co, 9,331.
 Donora (borough), Washington co, 8,174
 Dubois (borough), Clearfield county, 12,623.
 Dunmore (borough), Lackawanna county, 17,615.
 Duquesne (borough), Allegheny co, 15,727.
 Duryea (borough), Luzerne county, 7,487.
 East Conemaugh (borough), Cambria county, 5,046.
 East Pittsburg (borough), Allegheny county, 5,615.
 Easton (city), Northampton county, 28,523.
 Edwardsville (borough), Luzerne co, 8,407.
 Erie (city), Erie county, 66,525
 Etna (borough), Allegheny county, 5,830.
 Forest City (borough), Susquehanna county, 5,749.
 Franklin (city), Venango county, 9,767
 Freeland (borough), Luzerne county, 6,197.
 Gilberton (borough), Schuylkill co., 5,401.
 Glassport (borough), Allegheny co, 5,540
 Greater Punxsutawney (borough), Jefferson county, 9,058.
 Greensburg (borough), Westmoreland county, 13,012.
 Greenville (borough), Mercer county, 5,909.
 Hanover (borough), York county, 7,057.
 Harrisburg (city), Dauphin county, 64,186.
 Hazleton (city), Luzerne county, 25,452
 Homestead (borough), Allegheny co, 18,713.
 Huntingdon (borough), Huntingdon county, 6,861
 Indiana (borough), Indiana county, 5,749.
 Jeanette (borough), Westmoreland county, 8,077
 Jersey Shore (borough), Lycoming county, 5,381
 Johnstown (city), Cambria county, 55,482.
 Juniata (borough), Blair county, 5,285
 Kane (borough), McKean county, 6,626
 Kingston (borough), Luzerne county, 6,449.
 Knoxville (borough), Allegheny co., 5,651.
 Lancaster (city), Lancaster county, 47,227.
 Lansford (borough), Carbon county, 8,321.
 Larksville (borough), Luzerne county, 9,288.
 Latrobe (borough), Westmoreland co, 8,777.
 Lebanon (city), Lebanon county, 19,240
 Lehighton (borough), Carbon county, 5,316.
 Lewiston (borough), Mifflin county, 8,166
 Lock Haven (city), Clinton county, 7,772
 Luzerne (borough), Luzerne county, 5,426.
 McKees Rocks (borough), Allegheny county, 14,702
 McKeesport (city), Allegheny county, 42,694.
 Mahanoy City (borough), Schuylkill county, 15,936.
 Meadville (city), Crawford county, 12,780.
 Middletown (borough), Dauphin co, 5,374.
 Millvale (borough), Allegheny county, 7,861.
 Milton (borough), Northumberland county, 7,460
 Minersville (borough), Schuylkill co., 7,240
 Monessen (borough), Westmoreland county, 11,775.
 Monongahela (city), Washington co., 7,598
 Mt Carmel (borough), Northumberland county, 17,532
 Mt. Pleasant (borough), Westmoreland county 5,812
 Munhall (borough), Allegheny co, 5,185
 Naticoke (borough), Luzerne county, 18,877.
 New Brighton (borough), Beaver co, 8,329.
 Newcastle (city), Lawrence county, 36,280.
 New Kensington (borough), Westmoreland county, 7,707.
 Norristown (borough), Montgomery county, 27,875
 North Braddock (borough), Allegheny county, 11,824.
 Northampton (borough), Northampton county, 8,729.
 Oil City (city), Venango county, 15,657.
 Old Forge (borough), Lackawanna county, 11,324.
 Olyphant (borough), Lackawanna co, 8,505.
 Philadelphia (city), Philadelphia county, 1,549,008.
 Phoenixville (borough), Chester co, 10,743.
 Pittsburg (city), Allegheny county, 533,905.
 Pittston (city), Luzerne county, 16,267.
 Plymouth (borough), Luzerne co, 16,996.
 Pottstown (borough), Montgomery county, 15,599
 Pottsville (borough), Schuylkill co, 20,236.
 Rankin (borough), Allegheny county, 6,042.
 Reading (city), Berks county, 96,071
 Ridgway (borough), Elk county, 5,408
 Rochester (borough), Beaver county, 5,903.
 St Clair (borough), Allegheny co, 5,640.
 St Clair (borough), Schuylkill co, 6,455
 St Marys (borough), Elk county, 6,346
 Sayre (borough), Bradford county, 6,426
 Scottdale (borough), Westmoreland county, 5,456.
 Scranton (city), Lackawanna county, 129,867.
 Shamokin (borough), Northumberland county, 19,588
 Sharon (borough), Mercer county, 15,270
 Sharpsburg (borough), Allegheny co., 8,153.
 Shenandoah (borough), Schuylkill county, 25,774
 South Bethlehem (borough), Northampton county, 19,973
 South Sharon (borough), Mercer co, 10,190.
 Steelton (borough), Dauphin county, 14,246.
 Sunbury (borough), Northumberland county, 13,770.
 Swissvale (borough), Allegheny co., 7,381.
 Swoyersville (borough), Luzerne co, 5,396.
 Tamaqua (borough), Schuylkill co, 9,462.
 Tarentum (borough), Allegheny co, 7,414
 Taylor (borough), Lackawanna co., 7,414
 Throop (borough), Lackawanna co., 5,133.
 Titusville (city), Crawford county, 8,533
 Tyrone (borough), Blair county, 7,176
 Uniontown (borough), Fayette co., 13,344.
 Warren (borough), Warren county, 11,080.
 Washington (borough), Washington county, 18,778.
 Waynesboro (borough), Franklin co., 7,199.

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West Berwick (borough), Columbia county, 5,512

Westchester (borough), Chester co., 11,767.

West Pittston (borough), Luzerne co., 6,848.

Wilkes-Barre (city), Luzerne co., 67,105

Wilkesburg (borough), Allegheny county, 18,924

Williamsport (city), Lycoming co., 31,860

Wilmerding (borough), Allegheny co., 6,133.

Windbar (borough), Somerset county 8,013

Winton (borough), Lackawanna co., 5,280

York (city), York county, 44,750

Porto Rico. Population of the territory, 1,118,012

The population of the six cities containing more than 8,000 is as follows:

Arecibo, 9,612

Caguas, 10,354

Guyama, 8,321

Mayaguez, 16,591.

Ponce, 35,027

San Juan, 48,716.

Rhode Island. Population of the State, 542,610 Population by counties. Bristol, 17,602; Kent, 30,378; Newport, 39,335; Providence, 424,353; Washington, 24,942

The following cities and towns in Rhode Island have a population in excess of 5,000.

Bristol (town), Bristol county, 8,565

Burrillville (town), Providence co., 7,878.

Central Falls (city), Providence co., 22,754

Coventry (town), Kent county, 5,848

Cranston (city), Providence co., 21,107.

Cumberland (town), Providence co., 10,107.

East Providence (town), Providence co., 15,808.

Johnston (town), Providence county, 5,935.

Lincoln (town), Providence county, 9,825.

Newport (city), Newport county, 27,149

North Providence (town), Providence co., 5,407.

Pawtucket (city), Providence co., 51,622

Providence (city), Providence co., 224,326.

South Kingstown (town), Washington co., 5,176.

Warren (town), Bistol county, 6,585.

Warwick (town), Kent county, 26,629.

Westerly (town), Washington co., 8,696.

Woonsocket (city), Providence co., 38,125.

South Carolina. Population of State, 1,515,400. Population by counties: Abbeville,

34,804; Aiken, 41,849; Anderson, 69,568; Bam-

berg, 18,544; Barnwell, 34,209; Beaufort, 30,

355; Berkeley, 23,487; Calhoun, 16,634; Charles-

ton, 88,594; Cherokee, 26,179; Chester, 29,425;

Chesterfield, 26,301; Clarendon, 32,188; Col-

leton, 35,390; Darlington, 36,027; Dillon, 22,615;

Dorchester, 17,891; Edgefield, 28,281; Fairfield,

29,442; Florence, 35,671; Georgetown, 22,270;

Greenville, 68,377; Greenwood, 34,225; Hamp-

ton, 25,126; Horry, 26,995; Kershaw, 27,094;

Lancaster, 26,650; Laurens, 41,550; Lee, 25,318;

Lexington, 32,040; Marion, 20,596; Marlboro,

31,189; Newberry, 34,586; Oconee, 27,337;

Orangeburg, 55,893; Pickens, 25,422; Richland,

55,143; Saluda, 20,943; Spartanburg, 83,465;

Sumter, 38,472; Union, 29,911; Williamsburg,

37,626; York, 47,718.

The following cities and towns in South Carolina have a population in excess of 5,000.

Anderson (city), Anderson county, 9,654.

Charleston (city), Charleston co., 58,833.

Columbia (city), Richland county, 26,319.

Florence (city), Florence county, 7,057.

Georgetown (city), Georgetown co., 5,530.

Greenville (city), Greenville co., 15,741

Greenwood (town), Greenwood co., 6,614.

Newberry (town), Newberry co., 5,028

Orangeburg (city), Orangeburg co., 5,906.

Rock Hill (city), York county, 7,210.

Spartanburg (city), Spartanburg co., 17,517.

Sumter (city), Sumter county, 8,109

Union (town), Union county, 5,623.

South Dakota. Population of the State, 583,883, Indians not taxed, 8,212. Population by counties. Armstrong, 647; Aurora, 6,143; Beadle, 15,776; Bonhomme, 11,061; Brookings, 14,178; Brown, 25,867; Brule, 6,451; Buffalo, 1,589; Butte, 4,993; Campbell, 5,244; Charles Mix, 14,899; Clark, 10,901; Clay, 8,711; Codington, 14,092; Corson, 2,929; Custer, 4,458; Davison, 11,625; Day, 14,372; Deuel, 7,768; Dewey, 1,145; Douglas, 6,400; Edmunds, 7,654; Fall River, 7,763; Faulk, 6,716; Grant, 10,303; Gregory, 13,061; Hamlin, 7,475; Hand, 7,870; Hanson, 6,237; Harding, 4,228; Hughes, 6,271; Hutchinson, 12,319; Hyde, 3,307; Jerauld, 5,120; Kingsbury, 12,560; Lake, 10,711; Lawrence, 19,694; Lincoln, 12,712; Lyman, 10,848; McCook, 9,589; McPherson, 6,791; Marshall, 8,021; Meade, 12,640; Miner, 7,661; Minnehaha, 29,631; Moody, 8,695; Pennington, 12,453; Perkins, 11,348; Potter, 4,466; Roberts, 14,897; Sanborn, 6,607; Schnasse, 292; Spink, 15,981; Stanley, 14,975; Sterling, 252; Sully, 2,462; Tripp, 8,323; Turner, 13,840; Union, 10,676; Walworth, 6,488; Yankton, 13,135; Pine Ridge Indian reservation, 6,607; Rosebud Indian reservation, 3,960.

The following cities in South Dakota have a population in excess of 5,000.

Aberdeen, Brown county, 10,753.

Huron, Beadle county, 5,791.

Lead, Lawrence county, 8,392.

Mitchell, Davison county, 6,515

Sioux Falls, Minnehaha county, 14,094.

Watertown, Codington county, 7,010

Tennessee. Population of State, 2,184,789. Population by counties.

Anderson, 17,717;

Bedford, 22,667; Benton, 12,452; Bledsoe, 6,329;

Blount, 20,809; Bradley, 16,336; Campbell, 27,

387; Cannon, 10,825; Carroll, 23,971; Carter,

10,848; Cheatham, 10,540; Chester, 9,090;

Claiborne, 23,504; Clay, 9,009; Cocke, 19,399;

Coffee, 15,625; Crockett, 16,076; Cumberland,

9,327; Davidson, 149,478; Decatur, 10,093; De-

kalb, 15,434; Dickson, 19,955; Dyer, 27,721;

Fayette, 30,257; Fentress, 7,446; Franklin, 20,

491; Gibson, 41,630; Giles, 32,629; Grainger,

13,888; Greene, 31,083; Grundy, 8,322; Ham-

blen, 13,650; Hamilton, 89,267; Hancock, 10,

778; Hardeman, 23,011; Hardin, 17,521;

Hawkins, 23,587; Haywood, 25,910; Henderson,

17,030; Henry, 25,434; Hickman, 16,527; Hous-

ton, 6,224; Humphreys, 13,908; Jackson, 15,036;

James, 5,210; Jefferson, 17,755; Johnson, 13,191;

Knox, 94,187; Lake, 8,704; Lauderdale, 21,105;

Lawrence, 17,569; Lewis, 6,033; Lincoln, 25,

908; Loudon, 13,612; McNinn, 21,046; McNairy,

16,356; Macon, 14,559; Madison, 39,357; Marion,

18,820; Marshall, 16,872; Maury, 40,456; Meigs,

6,131; Monroe, 20,716; Montgomery, 33,672;

Moore, 4,800; Morgan, 11,458; Obion, 29,946;

Overton, 15,854; Perry, 8,815; Pickett, 5,087;

Polk, 14,116; Putnam, 20,023; Rhea, 15,410;

Roane, 22,860; Robertson, 25,466; Rutherford,

33,199; Scott, 12,947; Sequatchie, 4,202; Sevier,

22,296; Shelby, 191,439; Smith, 18,548; Stewart,

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14,860; Sullivan, 28,120; Sumner, 25,621; Tipton, 29,459; Trousdale, 5,874; Unicoi, 7,201; Union, 11,414; Van Buren, 2,784; Warren, 16,534; Washington, 28,968; Wayne, 12,062; Weakley, 31,929; White, 15,420; Williamson, 24,213; Wilson, 25,394

The following cities and towns in Tennessee have a population in excess of 5,000

Bristol (town), Sullivan county, 7,148.
Chattanooga (city), Hamilton co, 41,604
Clarksville (city), Montgomery co, 8,548
Cleveland (city), Bradley county, 5,549.
Columbia (city), Maury county, 5,754
Jackson (city), Madison county, 15,779
Johnson City (city), Washington co, 8,502.
Knoxville (city), Knox county, 36,346
Memphis (city), Shelby county, 131,105
Nashville (city), Davidson county, 110,364
Park City (town), Knox county, 5,126.

Texas. Population of State, 3,896,542. Population by counties: Anderson, 29,650; Andrews, 975; Angelina, 17,705; Aransas, 2,106; Archer, 6,525; Armstrong, 2,682; Atascosa, 10,004; Austin, 17,699; Bailey, 312; Bandera, 4,921; Bastrop, 25,344; Baylor, 8,411; Bee, 12,090; Bell, 49,186; Bexar, 119,676; Blanco, 4,311; Borden, 1,386; Bosque, 19,013; Bowie, 4,827; Brazoria, 13,299; Brazos, 18,919; Brewster, 5,220; Briscoe, 2,162; Brown, 22,935; Burleson, 18,687; Burnet, 10,755; Caldwell, 24,237; Calhoun, 3,635; Callahan, 12,973; Cameron, 27,158; Camp, 9,551; Carson, 2,127; Cass, 27,587; Castro, 1,850; Chambers, 4,234; Cherokee, 29,038; Childress, 9,538; Clay, 17,043; Cochran, 65; Coke, 6,412; Coleman, 22,618; Collin, 49,021; Collingsworth, 5,224; Colorado, 18,897; Comal, 8,434; Comanche, 27,186; Concho, 6,654; Cooke, 26,603; Coryell, 21,703; Cottle, 4,396; Crane, 331; Crockett, 1,295; Crosby, 1,765; Dallam, 4,001; Dallas, 135,748; Dawson, 2,320; De Witt, 23,501; Deaf Smith, 3,942; Delta, 14,566; Denton, 31,258; Dickens, 3,092; Dimmit, 3,460; Donley, 5,284; Duval, 8,964; Eastland, 23,421; Ector, 1,178; Edwards, 3,768; El Paso, 52,599; Ellis, 53,629; Erath, 32,095; Falls, 35,649; Fannin, 44,801; Fayette, 29,796; Fisher, 12,596; Floyd, 4,638; Foard, 5,726; Fort Bend, 18,168; Franklin, 9,331; Freestone, 20,557; Frio, 8,895; Gaines, 1,255; Galveston, 44,479; Garza, 1,995; Gillespie, 9,447; Glasscock, 1,143; Goliad, 9,909; Gonzales, 28,055; Gray, 3,405; Grayson, 65,996; Gregg, 14,140; Grimes, 21,205; Guadalupe, 24,913; Hale, 7,566; Hall, 8,279; Hamilton, 15,315; Hansford, 935; Hardeman, 11,213; Hardin, 12,947; Harris, 115,693; Harrison, 37,243; Hartley, 1,298; Haskell, 16,249; Hays, 15,518; Hemphill, 3,170; Henderson, 20,131; Hidalgo, 13,728; Hill, 46,760; Hockley, 137; Hood, 10,008; Hopkins, 31,038; Houston, 29,564; Howard, 8,881; Hunt, 48,116; Hutchinson, 892; Irion, 1,283; Jack, 11,817; Jackson, 6,471; Jasper, 14,000; Jeff Davis, 1,678; Jefferson, 38,182; Johnson, 34,460; Jones, 24,299; Karnes, 14,942; Kaufman, 35,223; Kendall, 4,517; Kent, 2,655; Kerr, 5,505; Kimble, 3,261; King, 810; Kinney, 3,401; Knox, 9,025; La Salle, 4,747; Lamar, 46,544; Lamb, 540; Lampasas, 9,532; Lavaca, 26,418; Lee, 13,132; Leon, 16,583; Liberty, 10,686; Limestone, 34,622; Lipscomb, 2,634; Live Oak, 3,442; Llano, 6,520; Loving, 249; Lubbock, 3,624; Lynn, 1,713; McCulloch, 1,405; McLennan, 73,250; McMullen, 1,091; Madison, 10,318; Marion, 10,472; Martin, 1,549; Mason, 5,681; Matagorda, 13,594; Maverick, 5,151; Medina, 13,415;

Menard, 2,707; Midland, 3,464; Milam, 36,780; Mills, 9,694; Mitchell, 8,956; Montague, 25,123; Montgomery, 15,679; Moore, 561; Morris, 10,439; Motley, 2,396; Nacogdoches, 27,406; Navarro, 47,070; Newton, 10,850; Nolan, 11,999; Nueces, 21,955; Ochiltree, 1,602; Oldham, 812; Orange, 9,528; Palo Pinto, 19,506; Panola, 20,242; Parker, 26,331; Parmer, 1,555; Pecos, 2,071; Polk, 17,459; Potter, 12,424; Presidio, 5,218; Rains, 6,787; Randall, 3,312; Reagan, 392; Red River, 28,564; Reeves, 4,392; Refugio, 2,814; Roberts, 950; Robertson, 27,454; Rockwall, 8,072; Runnels, 20,858; Rusk, 26,946; Sabine, 8,582; San Augustine, 11,264; San Jacinto, 9,542; San Patricio, 7,307; San Saba, 11,245; Schleicher, 1,893; Scurry, 10,924; Shackelford, 4,201; Shelby, 26,423; Sherman, 1,376; Smith, 41,746; Somervell, 3,931; Starr, 13,151; Stephens, 7,980; Sterling, 1,493; Stonewall, 5,320; Sutton, 1,569; Swisher, 4,012; Tarrant, 108,572; Taylor, 26,293; Terrell, 1,430; Terry, 1,474; Throckmorton, 4,563; Titus, 16,422; Tom Green, 17,882; Travis, 55,620; Trinity, 12,768; Tyler, 10,250; Upshur, 19,960; Upton, 501; Uvalde, 11,233; Val Verde, 8,613; Van Zandt, 25,651; Victoria, 14,990; Walker, 16,061; Waller, 12,138; Ward, 2,389; Washington, 25,561; Webb, 22,503; Wharton, 21,123; Wheeler, 5,258; Wichita, 16,094; Wilbarger, 12,000; Williamson, 42,228; Wilson, 17,066; Winkler, 442; Wise, 26,450; Wood, 23,417; Yoakum, 602; Young, 13,657; Zapata, 3,809; Zavalla, 1,889

The following cities and towns in Texas have a population in excess of 5,000

Ablene (city), Taylor county, 9,204
Amarillo (city), Potter county, 9,957.
Austin (city), Travis county, 29,860
Beaumont (city), Jefferson county, 20,640.
Brownsville (city), Cameron county, 10,517.
Brownwood (city), Brown county, 6,967.
Cleburne (city), Johnson county, 10,364
Corpus Christi (city), Nueces co., 8,222.
Corsicana (city), Navarro county, 9,749.
Dallas (city), Dallas county, 92,104.
Denison (city), Grayson county, 13,632.
El Paso (city), El Paso county, 39,279.
Ennis (city), Ellis county, 5,669
Fort Worth (city), Tarrant county, 73,312.
Gainesville (city), Cooke county, 7,624
Galveston (city), Galveston county, 36,981.
Greenville (city), Hunt county, 8,850.
Hillsboro (city), Hill county, 6,115
Houston (city), Harris county, 78,8000.
Houston Heights (town), Harris co, 6,984.
Laredo (city), Webb county, 14,855
Longview (city), Gregg county, 5,155.
Marshall (city), Harrison county, 11,452.
Orange (city), Orange county, 5,527
Palestine (city), Anderson county, 10,482.
Paris (city), Lamar county, 11,269.
Port Arthur (city), Jefferson co, 7,663
San Angelo (city), Tom Green co., 10,321.
San Antonio (city), Bexar county, 96,614
Sherman (city), Grayson county, 12,412.
Sulphur Springs (town), Hopkins co, 5,151.
Taylor (city), Williamson county, 5,314.
Temple (city), Bell county, 10,903.
Terrell (city), Kaufman county, 7,050.
Texarkana (city), Bowie county, 9,790
Tyler (city), Smith county, 10,100.
Waco (city), McLennan county, 26,425.
Waxahachie (town), Ellis county, 6,205.
Weatherford (city), Parker county, 5,074
Wichita Falls (city), Wichita county, 8,200.

CENSUS OF STATES

Utah. Population of State, 373,351; Indians not taxed, 1,487. Population by counties. Beaver, 4,717; Boxelder, 13,894; Cache, 23,062; Carbon, 8,624; Davis, 10,191; Emery, 6,750; Garfield, 3,660; Grand, 1,595; Iron, 3,933; Juab, 10,702; Kane, 1,652; Millard, 6,118; Morgan, 2,407; Piute, 1,734; Rich, 1,883; Salt Lake, 131,426; San Juan, 2,377; Sanpete, 16,704; Sevier, 9,775; Summit, 8,200; Tooele, 7,924; Uinta, 7,050; Utah, 37,942; Wasatch, 8,920; Washington, 5,123; Wayne, 1,749; Weber, 35,179.

The following cities in Utah have a population in excess of 5,000

Logan, Cache county, 7,522.
Ogden, Weber county, 25,580.
Provo, Utah county, 8,925.
Salt Lake City, Salt Lake county, 92,777

Vermont. Population of State, 355,956. Population by counties. Addison, 20,010; Bennington, 21,378; Caledonia, 26,031; Chittenden, 42,447; Essex, 7,384; Franklin, 29,866; Grand Isle, 3,761; Lamoille, 12,585; Orange, 18,703; Orleans, 23,337; Rutland, 48,139; Washington, 41,702; Windham, 26,932; Windsor, 33,681.

The following cities, towns and villages in Vermont have a population in excess of 5,000.

Barre (city), Washington county, 10,734.
Bennington (village), Bennington co, 6,211.
Brattleboro (village), Windham co, 6,517.
Burlington (city), Chittenden co, 20,468.
Colchester (town), Chittenden co, 6,450.
Montpelier (city), Washington co, 7,856.
Rutland (city), Rutland county, 13,546.
St Albans (city), Franklin county, 6,381.
St Johnsbury (village), Caledonia co., 6,693.

Virginia. Population of State, 2,061,612. Population by counties. Accomac, 36,650; Albemarle, 29,871; Alexandria, 10,231; Allegany, 14,173; Amelia, 8,720; Amherst, 18,932; Appomattox, 8,904; Augusta, 32,445; Bath, 6,538; Bedford, 29,549; Bland, 5,154; Botetourt, 17,727; Brunswick, 19,244; Buchanan, 12,334; Buckingham, 15,204; Campbell, 23,043; Caroline, 16,596; Carroll, 21,116; Charles City, 5,253; Charlotte, 15,785; Chesterfield, 21,299; Clarke, 7,468; Craig, 4,711; Culpeper, 13,472; Cumberland, 9,195; Dickinson, 9,199; Dinwiddie, 15,442; Elizabeth City, 21,225; Essex, 9,105; Fairfax, 20,536; Fauquier, 22,526; Floyd, 14,092; Fluvanna, 8,323; Franklin, 26,480; Frederick, 12,787; Giles, 11,623; Gloucester, 12,477; Goochland, 9,237; Grayson, 19,856; Greene, 6,937; Greenesville, 11,890; Halifax, 40,044; Hanover, 17,200; Henrico, 23,437; Henry, 18,459; Highland, 5,317; Isle of Wight, 14,929; James City, 3,624; King and Queen, 9,576; King George, 6,378; King William, 8,547; Lancaster, 9,572; Lee, 23,840; Loudoun, 21,167; Louisa, 16,578; Lunenburg, 12,780; Madison, 10,955; Mathews, 8,922; Mecklenburg, 28,956; Middlesex, 8,852; Montgomery, 17,268; Nansemond, 26,886; Nelson, 16,821; New Kent, 4,682; Norfolk, 52,744; Northampton, 16,672; Northumberland, 10,777; Nottoway, 13,462; Orange, 13,486; Page, 14,147; Patrick, 17,195; Pittsylvania, 50,709; Powhatan, 6,009; Prince Edward, 14,266; Prince George, 7,848; Prince William, 12,026; Princess Anne, 11,526; Pulaski, 17,246; Rappahannock, 8,044; Richmond, 7,415; Roanoke, 19,623; Rockbridge, 21,171; Rockingham, 34,903; Russell, 23,474; Scott, 23,814; Shenandoah, 20,942; Smyth, 20,326; Southampton, 26,302; Spottsylvania, 9,935; Stafford, 8,070; Surry, 9,715; Sussex, 13,664;

Tazewell, 24,946; Warren, 8,589; Warwick, 6,041; Washington, 32,830; Westmoreland, 9,313; Wise, 34,162; Wythe, 20,372; York, 7,757.

The following represent the independent cities in Virginia that have a population in excess of 5,000

Alexandria, 15,329
Bristol, 6,247
Charlottesville, 6,765.
Clifton Forge, 5,748
Danville, 19,020
Fredericksburg, 5,874
Lynchburg, 29,494
Newport News, 20,205
Norfolk, 67,452.
Petersburg, 24,127
Portsmouth, 33,190
Richmond, 127,628
Roanoke, 34,874
Staunton, 10,604
Winchester, 5,864

Other places having a population of more than 5,000 are.

Hampton (city), Elizabeth City co., 5,505.
Suffolk (town), Nansemond county, 7,008.

Washington. Population of State, 1,141,990; Indians not taxed, 1,856. Population by counties. Adams, 10,920; Asotin, 5,831; Benton, 7,937; Chehalis, 35,590; Chelan, 15,104; Clallam, 6,755; Clarke, 26,115; Columbia, 7,042; Cowlitz, 12,561; Douglas, 9,227; Ferry, 4,800; Franklin, 5,153; Garfield, 4,199; Grant, 8,698; Island, 4,704; Jefferson, 8,337; King, 284,638; Kitsap, 17,647; Kittitas, 18,561; Klickitat, 10,180; Lewis, 32,127; Lincoln, 17,539; Mason, 5,156; Okanogan, 12,887; Pacific, 12,532; Pierce, 120,812; San Juan, 3,603; Skagit, 29,241; Skamania, 2,887; Snohomish, 59,209; Spokane, 139,404; Stevens, 25,297; Thurston, 17,581; Wahkiakum, 3,285; Walla Walla, 31,931; Whatcom, 49,511; Whitman, 33,280; Yakima, 41,709.

The following cities in Washington have a population in excess of 5,000

Aberdeen, Chehalis county, 13,660
Bellingham, Whatcom county, 24,298
Centralia, Lewis county, 7,311.
Everett, Snohomish county, 24,814.
Hoquiam, Chehalis county, 8,171
North Yakima, Yakima county, 14,082
Olympia, Thurston county, 6,996.
Seattle, King county, 237,194
Spokane, Spokane county, 104,402.
Tacoma, Pierce county, 83,743.
Vancouver, Clarke countv, 9,300
Walla Walla, Walla Walla co., 19,364

West Virginia. Population of State, 1,221,119. Population by counties. Barbour, 15,858; Berkeley, 21,999; Boone, 10,331; Braxton, 23,023; Brooke, 11,098; Cabell, 46,685; Calhoun, 11,258; Clay, 10,233; Doddridge, 12,672; Fayette, 51,903; Gilmer, 11,379; Grant, 7,838; Greenbrier, 24,833; Hampshire, 11,694; Hancock, 10,465; Hardy, 9,163; Harrison, 48,381; Jackson, 20,956; Jefferson, 15,889; Kanawha, 81,457; Lewis, 18,281; Lincoln, 20,491; Logan, 14,476; McDowell, 47,856; Marion, 42,794; Marshall, 32,388; Mason, 23,019; Mercer, 38,371; Mineral, 16,674; Mingo, 19,431; Monongalia, 21,334; Monroe, 13,055; Morgan, 7,848; Nicholas, 17,699; Ohio, 57,572; Pendleton, 9,349; Pleasants, 8,074; Pocahontas, 14,740; Preston, 26,341; Putnam, 18,587; Raleigh, 25,633; Randolph, 26,028; Ritchie, 17,875; Roane, 21,543; Summers, 18,520; Taylor, 16,554; Tucker, 18,675;

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Tyler, 16,211; Upshur, 16,629; Wayne, 24,081; Webster, 9,680; Wetzel, 23,855; Wirt, 9,047; Wood, 38,001, Wyoming, 10,392

The following cities in West Virginia have a population in excess of 5,000

Bluefield, Mercer county, 11,188
Charleston, Kanawha county, 22,996.
Clarksburg, Harrison county, 9,201.
Elkins, Randolph county, 5,260
Fairmont, Marion county, 9,711.
Grafton, Taylor county, 7,563.
Huntington, Cabell county, 31,161
Martinsburg, Berkeley county, 10,698.
Morgantown, Monongalia county, 9,150.
Moundsville, Marshall county, 8,918.
Parkersburg, Wood county, 17,842.
Wheeling, Ohio county, 41,641

Wisconsin. Population of State, 2,333,860; Indians not taxed, 1,007. Population by counties: Adams, 8,604; Ashland, 21,965, Barron, 29,114; Bayfield, 15,987; Brown, 54,098, Buffalo, 16,006, Burnett, 9,026; Calumet, 16,701, Chippewa, 32,103; Clark, 30,074, Columbia, 31,129; Crawford, 16,288, Dane, 77,435, Dodge, 47,436, Door, 18,711, Douglas, 47,422, Dunn, 25,260; Eau Claire, 32,721; Florence, 3,381; Fond du Lac, 51,610, Forest, 6,782; Grant, 39,007, Green, 21,641; Green Lake, 15,491; Iowa, 22,497, Iron, 8,306, Jackson, 17,075; Jefferson, 34,306, Juneau, 19,569; Kenosha, 32,929; Keweenaw, 16,784, La Crosse, 43,996, Lafayette, 20,075, Langlade, 17,062; Lincoln, 19,064; Manitowoc, 44,978, Marathon, 55,054; Marinette, 33,812, Marquette, 10,741; Milwaukee, 433,187; Monroe, 28,881; Oconto, 25,657; Oneida, 11,433; Outagamie, 49,102; Ozaukee, 17,123; Pepin, 7,577, Pierce, 22,079; Polk, 21,367; Portage, 30,945, Price, 13,795, Racine, 57,424; Richland, 18,809; Rock, 55,538; Rusk, 11,160; St. Croix, 25,910; Sauk, 32,869; Sawyer, 6,227; Shawano, 31,884, Sheboygan, 54,888, Taylor, 13,641; Trempealeau, 22,928; Vernon, 28,116; Vilas, 6,019, Walworth, 29,614; Washburn, 8,196; Washington, 23,784; Waukesha, 37,100; Waupaca, 32,782, Waushara, 18,886; Winnebago, 62,116; Wood, 30,583.

The following cities in Wisconsin have a population in excess of 5,000

Antigo, Langlade county, 7,196.

Appleton, Outagamie county, 16,773.
Ashland, Ashland county, 11,594
Baraboo, Sauk county, 6,324
Beaverdam, Dodge county, 6,758.
Beloit, Rock county, 15,125
Chippewa Falls, Chippewa co., 8,893.
Eau Claire, Eau Claire county, 18,310
Fond du Lac, Fond du Lac county, 18,797.
Grand Rapids, Wood county, 6,521.
Green Bay, Brown county, 25,236
Janesville, Rock county, 13,894
Kenosha, Kenosha county, 12,371
La Crosse, La Crosse county, 30,417.
Madison, Dane county, 25,531
Manitowoc, Manitowoc county, 13,027.
Marinette, Marinette county, 14,610
Marshfield, Wood county, 5,783
Menasha, Winnebago county, 6,081
Menominee, Dunn county, 5,036.
Merrill, Lincoln county, 8,689
Milwaukee, Milwaukee county, 373,857.
Neenah, Winnebago county, 5,734.
Oconto, Oconto county, 5,629
Oshkosh, Winnebago county, 33,062.
Portage, Columbia county, 5,440.
Racine, Racine county, 38,002
Rhinelander, Oneida county, 5,637.
Sheboygan, Sheboygan county, 26,398
South Milwaukee, Milwaukee county, 6,092.
Stevens Point, Portage county, 8,692.
Superior, Douglas county, 40,384
Watertown, Jefferson county, 8,740
Waukesha, Waukesha county, 8,740
Wausau, Marathon county, 16,560
West Allis, Milwaukee county, 6,645.

Wyoming. Population of State, 145,965; Indians not taxed, 1,307. Population by counties: Albany, 11,574, Bighorn, 8,886, Carbon, 11,282, Converse, 6,294, Crook, 6,492; Fremont, 11,822, Johnson, 3,453, Laramie, 26,127, Natrona, 4,766, Park, 4,909, Sheridan, 16,324; Sweetwater, 11,575, Uinta, 16,982; Weston, 4,960, National Park reservation, 519.

The following cities in Wyoming have a population in excess of 5,000:

Cheyenne, Laramie county, 11,320.
Laramie, Albany county, 8,237
Rock Springs, Sweetwater county, 5,778.
Sheridan, Sheridan county, 8,408.

AGRICULTURE.

The Census Bureau has issued special bulletins giving general farm data for the following States.

Colorado. Total number of farms, 45,839; total acreage, 13,448,000, improved acreage, 4,291,000, value of land and buildings, \$407,015,000; value of implements and machinery, \$12,761,000, expenditure for labor, \$10,723,000.

Connecticut. Total number of farms, 26,431; total acreage, 2,176,000, improved acreage, 984,000; value of land and buildings, \$136,621,000; value of implements and machinery, \$6,865,000; expenditure for labor, \$6,652,000.

Delaware. Total number of farms, 10,800; total acreage, 1,037,000; improved acreage, 712,000, value of land and buildings, \$52,926,000; value of implements and machinery, \$3,202,000; expenditure for labor, \$1,600,000.

District of Columbia. Total number of farms, 214; total acreage, 6,000; improved acreage, 5,000; value of land and buildings, \$6,301,000; value of implements and machinery, \$62,000; expenditure for labor, \$221,000.

Idaho. Total number of farms, 30,714; total acreage, 5,260,000; improved acreage, 2,773,000, value of land and buildings, \$244,420,000; value of implements and machinery, \$10,459,000, expenditure for labor, \$6,677,000.

Illinois. Total number of farms, 250,853; total acreage, 32,471,000; improved acreage, 28,005,000; value of land and buildings, \$3,511,194,000; value of implements and machinery, \$73,533,000; expenditure for labor, \$35,675,000.

Indiana. Total number of farms, 214,741; total acreage, 21,264,000; improved acreage, 16,903,000; value of land and buildings, \$1,590,-

AGRICULTURE

225,000; value of implements and machinery, \$40,880,000; expenditure for labor, \$17,903,000.

Kansas. Total number of farms, 177,299; total acreage, 43,261,000; improved acreage, 29,858,000; value of land and buildings, \$1,733,653; value of implements and machinery, \$48,244,000; expenditure for labor, \$20,474,000.

Maine. Total number of farms, 50,773; total acreage, 6,291,000; improved acreage, 2,358,000; value of land and buildings, \$158,676,000; value of implements and machinery, \$14,476,000; expenditure for labor, \$5,591,000.

Maryland. Total number of farms, 48,769; total acreage, 5,051,000; improved acreage, 3,353,000; value of land and buildings, \$240,774,000; value of implements and machinery, \$11,845,000; expenditure for labor, \$8,720,000.

Massachusetts. Total number of farms, 36,512; total acreage, 2,870,000; improved acreage, 1,162,000; value of land and buildings, \$191,298,000; value of implements and machinery, \$11,512,000; expenditure for labor, \$11,747,000.

Michigan. Total number of farms, 206,376; total acreage, 18,913,000; improved acreage, 12,819,000; value of land and buildings, \$897,057,000; value of implements and machinery, \$49,771,000; expenditure for labor, \$18,905,000.

Minnesota. Total number of farms, 155,759; total acreage, 27,623,000; improved acreage, 19,609,000; value of land and buildings, \$1,259,510,000; value of implements and machinery, \$52,243,000; expenditure for labor, \$22,186,000.

Missouri. Total number of farms, 276,081; total acreage, 34,516,000; improved acreage, 24,528,000; value of land and buildings, \$1,710,505,000; value of implements and machinery, \$50,769,000; expenditure for labor, \$18,526,000.

Montana. Total number of farms, 25,946; total acreage, 13,499,000; improved acreage, 3,631,000; value of lands and buildings, \$250,485,000; value of implements and machinery, \$10,522,000; expenditure for labor, \$10,874,000.

Nebraska. Total number of farms, 129,419; total acreage, 33,553,000; improved acreage, 24,356,000; value of land and buildings, \$1,811,557,000; value of implements and machinery, \$44,215,000; expenditure for labor, \$14,944,000.

Nevada. Total number of farms, 2,660; total acreage, 2,585,000; improved acreage, 745,000; value of land and buildings, \$39,153,000; value of implements and machinery, \$1,558,000; expenditure for labor, \$2,978,000.

New Hampshire. Total number of farms, 26,913; total acreage, 3,242,000; improved acreage, 927,000; value of land and buildings, \$85,542,000; value of implements and machinery, \$5,870,000; expenditure for labor, \$3,340,000.

New Jersey. Total number of farms, 33,161; total acreage, 2,562,000; improved acreage, 1,800,000; value of land and buildings, \$213,141,000; value of implements and machinery, \$12,955,000; expenditure for labor, \$10,530,000.

New York. Total number of farms, 214, age, 14,825,000; value of land and buildings, \$1,176,222,000; value of implements and machinery, \$83,330,000; expenditure for labor, \$40,483,000.

North Dakota. Total number of farms, 74,165; total acreage, 28,392,000; improved acreage, 20,439,000; value of land and buildings, \$822,035,000; value of implements and machinery, \$43,887,000; expenditure for labor, \$21,715,000.

Ohio. Total number of farms, 271,383; total acreage, 24,074,000; improved acreage, 19,210,000; value of land and buildings, \$366,919,000; value of implements and machinery, \$51,115,000; expenditure for labor, \$25,314,000.

Oklahoma. Total number of farms, 189,438; total acreage, 28,717,000; improved acreage, 17,496,000; value of land and buildings, \$736,473,000; value of implements and machinery, \$27,003,000; expenditure for labor, \$9,794,000.

Oregon. Total number of farms, 45,128; total acreage, 11,628,000; improved acreage, 4,253,000; value of land and buildings, \$453,571,000; value of implements and machinery, \$13,135,000; expenditure for labor, \$11,011,000.

Pennsylvania. Total number of farms, 218,394; total acreage, 18,556,000; improved acreage, 12,660,000; value of land and buildings, \$1,035,300,000; value of implements and machinery, \$70,547,000; expenditure for labor, \$25,079,000.

Rhode Island. Total number of farms, 5,191; total acreage, 442,000; improved acreage, 178,000; value of land and buildings, \$27,456,000; value of implements and machinery, \$1,753,000; expenditure for labor, \$1,675,000.

South Dakota. Total number of farms, 77,314; total acreage, 25,952,000; improved acreage, 15,802,000; value of land and buildings, \$1,003,451,000; value of implements and machinery, \$33,762,000; expenditure for labor, \$12,821,000.

Vermont. Total number of farms, 32,598; total acreage, 4,653,000; improved acreage, 1,633,000; value of land and buildings, \$101,813,000; value of implements and machinery, \$10,162,000; expenditure for labor, \$4,739,000.

Washington. Total number of farms, 55,744; total acreage, 11,663,000; improved acreage, 6,354,000; value of land and buildings, \$570,142,000; value of implements and machinery, \$16,653,000; expenditure for labor, \$15,223,000.

West Virginia. Total number of farms, 95,876; total acreage, 9,961,000; improved acreage, 5,482,000; value of land and buildings, \$262,458,000; value of implements and machinery, \$6,962,000; expenditure for labor, \$3,981,000.

Wisconsin. Total number of farms, 176,546; total acreage, 21,012,000; improved acreage, 11,882,000; value of land and buildings, \$1,179,558,000; value of implements and machinery, \$52,784,000; expenditure for labor, \$25,344,000.

The reports of farming conditions in other States were delayed in publication.

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MANUFACTURES.

The Census Bureau has issued special bulletins giving data about the manufacture of the following States:

Alabama. Number of establishments, 3,401; capital represented, \$173,479,000; number of salaried officials and clerks, 6,088; average number of wage-earners, 72,255; salaries and wages, \$33,936,000; value of products, \$146,431,000. Steam laundries, enumerated separately, 38; capital, \$546,000; number of employees, 1,248.

Arizona. Number of establishments, 311; capital represented, \$32,875,000; number of salaried officials and clerks, 496; average number of wage-earners, 6,415; salaries and wages, \$6,282,000; value of products, \$50,074,000. Steam laundries, 13; capital, \$193,000; number of employees, 298.

Florida. Number of establishments, 2,156; capital represented, \$65,128,000; number of salaried officials and clerks, 4,613; average number of wage-earners, 57,443; salaries and wages, \$27,906,000; value of products, \$72,724,000. Steam laundries, 28; capital, \$461,000; number of employees, 610.

Georgia. Number of establishments, 4,792; capital represented, \$202,913,000; number of salaried officials and clerks, 8,312; average number of wage-earners, 104,582; salaries and wages, \$43,878,000; value of products, \$202,641,000. Steam laundries, 42; capital, \$655,000; number of employees, 1,488.

Idaho. Number of establishments, 725; capital represented, \$32,377,000; number of salaried officials and clerks, 858; average number of wage-earners, 8,220; salaries and wages, \$6,482,000; value of products, \$22,479,000. Steam laundries, 24; capital, \$252,000; number of employees, 379.

Indiana. Number of establishments, 7,965; capital represented, \$508,582,000; number of salaried officials and clerks, 23,586; average number of wage-earners, 186,764; salaries and wages, \$121,674,000; value of products, \$578,728,000. Steam laundries, 163; capital, \$1,236,000; number of employees, 3,124.

Iowa. Number of establishments, 181; capital represented, \$1,262,000; number of salaried officials and clerks, 11,406; average number of wage-earners, 61,654; salaries and wages, \$43,535,000; value of products, \$259,268,000. Steam laundries, 181; capital, \$1,262,000; number of employees, 2,262.

Kansas. Number of establishments, 3,427; capital represented, \$154,952,000; number of salaried officials and clerks, 6,801; average number of wage-earners, 43,532; salaries and wages, \$32,773,000; value of products, \$325,357,000. Steam laundries, 138; capital, \$1,027,000; number of employees, 1,583.

Kentucky. Number of establishments, 4,776; capital represented, \$172,779,000; number of salaried officials and clerks, 8,610; average number of wage-earners, 65,401; salaries and wages, \$37,491,000; value of products, \$111,975,000. Steam laundries, 73; capital, \$730,000; number of employees, 1,682.

Louisiana. Number of establishments, 2,516; capital represented, \$221,806,000; number of salaried officials and clerks, 8,108; average number of wage-earners, 76,135; salaries and wages, \$42,335,000; value of products, \$223,928,000. Steam laundries, 25; capital, 796,000; number of employees, 1,098.

Mississippi. Number of establishments, 2,598; capital represented, \$72,393,000; number of salaried officials and clerks, 3,403; average number of wage-earners, 50,384; salaries and wages, \$22,421,000; value of products, \$80,555,000. Steam laundries, 30; capital, \$332,000; number of employees, 571.

Missouri. Number of establishments, 8,372; capital, \$442,847,000; number of salaried officials and clerks, 24,453; average number of wage-earners, 152,870; salaries and wages, \$109,694,000; value of products, \$572,085,000. Steam laundries, 171; capital, \$3,408,000; number of employees, 5,961.

Montana. Number of establishments, 680; capital represented, \$44,596,000; number of salaried officials and clerks, 1,381; average number of wage-earners, 11,660; salaries and wages, \$12,959,000; value of products, \$80,468,000. Steam laundries, 26; capital, \$677,000; number of employees, 699.

Nebraska. Number of establishments, 2,492; capital, \$84,015,000; number of salaried officials and clerks, 5,105; average number of wage-earners, 24,323; salaries and wages, \$19,432,000; value of products, \$198,669,000. Steam laundries, 76; capital, \$872,000; number of employees, 1,230.

Nevada. Number of establishments, 177; capital represented, \$9,807,000; number of salaried officials and clerks, 256; average number of wage-earners, 2,257; salaries and wages, \$2,360,000; value of products, \$11,887,000. Steam laundries, 5; capital, \$166,000; number of employees, 162.

New Hampshire. Number of establishments, 1,961; capital represented, \$139,873,000; number of salaried officials and clerks, 3,516; average number of wage-earners, 78,525; salaries and wages, \$40,286,000; value of products, \$164,461,000. Steam laundries, 61; capital, \$303,000; number of employees, 624.

New Mexico. Number of establishments, 310; capital represented, \$7,396,000; number of salaried officials and clerks, 315; average number of wage-earners, 3,903; salaries and wages, \$2,792,000; value of products, \$7,599,000. Steam laundries, 8; capital, \$164,000; number of employees, 162.

North Carolina. Number of establishments, 4,930; capital represented, \$217,183,000; number of salaried officials and clerks, 6,528; average number of wage-earners, 121,470; salaries and wages, \$41,257,000; value of products, \$216,614,000. Steam laundries, 43; capital, \$425,000; number of employees, 891.

North Dakota. Number of establishments, 753; capital represented, \$11,504,000; number of salaried officials and clerks, 639; average num-

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ber of wage-earners, 2,795; salaries and wages, \$2,422,000, value of products, \$19,150,000 Steam laundries, 34, capital, \$445,000; number of employees, 464

Oklahoma. Number of establishments, 2,310, capital represented, \$38,873,000, number of salaried officials and clerks, 2,193, average number of wage-earners, 13,143, salaries and wages, \$7,285,000, value of products, \$53,682,000. Steam laundries, 93; capital, \$782,000; number of employees, 1,190.

South Carolina. Number of establishments, 1,854, capital represented, \$173,221,000, number of salaried officials and clerks, 3,257, average number of wage-earners, 73,940; salaries and wages, \$24,117,000, value of products, \$113,236,000 Steam laundries, 24, capital, \$184,000; number of employees, 414

South Dakota. Number of establishments, 1,019; capital represented, \$12,971,000, number of salaried officials and clerks, 679; average

number of wage-earners, 3,585; salaries and wages, \$2,901,000, value of products, 17,845,000 Steam laundries, 28; capital, \$336,000, number of employees, 414.

Utah. Number of establishments, 749; capital represented, \$52,627,000, number of salaried officials and clerks, 1,660; average number of wage-earners, 11,785, salaries and wages, \$10,376,000, value of products, \$61,989,000. Steam laundries, 22, capital, \$500,000; number of employees, 795

Wyoming. Number of establishments, 266; capital represented, \$5,840,000; number of salaried officials and clerks, 258; average number of wage-earners, 2,811, salaries and wages, \$2,346,000; value of products, \$5,984,000. Steam laundries, 14, capital, \$100,000, number of employees, 183.

Steam laundries were separately presented in the 1910 Census as this is the first enumeration in which they were canvassed.

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Preliminary reports of the following industries were issued by the Bureau of the Census prior to 1 May, 1911

Automobiles. The automobile industry has had a most remarkable development in recent years. The number of establishments increased from 57 in 1899 to 316 in 1909, an increase of 454 per cent in the 10-year period. Of the 316 establishments in 1909, 265 manufactured automobiles as a main product, while complete machines were a minor product, or "side line," with 51 of the establishments. The total product of the industry increased in value from \$4,748,000 in 1899 to \$194,722,600 in 1909, an increase of 4,001 per cent. The value of products stated represents the product as actually turned out by the factories during the census year, and does not necessarily have any relation to the amount of sales for that period of time. A striking fact is the consistent development of the automobile industry in the states in which the carriage and wagon industry was of great importance. The inference is that, in a large measure, these states were equipped with the necessary skilled labor, thus giving the automobile industry an advantage and an impetus not enjoyed by other States. The number of automobiles manufactured increased from 3,723 in 1899 to 127,289 in 1909, or 3,319 per cent. Of these, 126,570 were built in establishments of which automobiles were the main product, and 719 in establishments of which such machines were merely minor products.

The production of automobiles by States was as follows. Michigan, 64,921 machines, valued at \$70,510,600, Ohio, 14,439, valued at \$23,724,700; Indiana, 17,484, valued at \$17,728,500; New York, 8,108, valued at \$17,618,100; Connecticut, 2,955, valued at \$7,405,900; Wisconsin, 5,641, valued at \$7,157,500; Massachusetts, 3,467, valued at \$6,232,700; Illinois, 3,453, valued at \$4,485,500; Pennsylvania, 2,001, valued at \$4,151,300; and Missouri, 728, valued at \$1,074,300. California, Maryland, Iowa, New Jersey, Minnesota, Colorado, Kansas, Kentucky, Nebraska, Oklahoma, Rhode Island, South Dakota,

Tennessee, Texas, and Georgia has a combined product of 4,092 machines of the value of \$4,997,000.

Independently of the factories which produce complete machines and parts incidentally, there is another group of establishments which produce bodies and parts, which eventually are used as materials by the establishments noted in the main table. There were, in 1909, 476 such establishments reported, with a product valued at \$55,544,700. This does not exhaust all the establishments which contribute to the automobile industry, as there are others manufacturing such supplies in connection with other products, but for which separate statistics can not be compiled.

Carpets and Rugs. The number of establishments in 1909 was 140 as against 133 in 1899. The amount of foreign wool used in the manufacture of carpets and rugs increased from 51,762,000 pounds in 1899 to 63,904,000 in 1909, or 23 per cent; the cost thereof increased from \$8,077,000 to \$11,696,000, or 45 per cent. In addition, a considerable quantity of foreign wool is consumed in the manufacture of woolen and worsted yarn purchased by carpet manufacturers. The total value of products increased from \$48,102,000 in 1899 to \$71,854,000 in 1909, or 49 per cent, showing a substantial growth for the industry during the decade. In 1899 the number of square yards of carpets and rugs was 76,410,000 compared with 91,829,000 in 1909. In 1899 rugs, woven whole, constituted only 16 per cent of the total, or 12,172,000 square yards, while in 1909 they constituted 39 per cent of the total, or 35,596,000 square yards. Although the census returns showed an increase in the manufacture of carpets from 1899 to 1904, the number of square yards manufactured in 1909 was nearly 10,000,000 less than in 1899.

Cooperage Stock. The reported production of tight-barrel staves during 1909 was 379,231,000 pieces, valued at \$9,201,964, as against 345,280,000 pieces in 1908, and 385,232,000 pieces in 1907, valued at \$10,009,295 and \$12,942,885,

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respectively. The output of tight-barrel heading during the same years was 20,691,201 sets in 1909, 20,515,072 sets in 1908, and 27,692,994 sets in 1907, valued at \$3,716,296, \$4,397,148, and \$6,864,485, respectively. With respect to geographic distribution little change is noted in the industry of tight-stave manufacture during recent years, the five states of Arkansas, Kentucky, West Virginia, Mississippi, and Tennessee reporting 65.5 per cent of the total production in 1909, 82 per cent in 1908, and 68.7 per cent in 1907. Of this group, Arkansas has led in all three years in aggregate output of tight-barrel staves, contributing 28.4 per cent of the total in 1907, 27.3 per cent in 1908, and 23.1 per cent in 1909.

The census of slack cooperage stock production in the United States during the calendar year 1909 disclosed that 1,506 establishments were engaged in the industry, as against 1,151 in 1908 and 950 in 1907. The reported output of staves was 2,029,548,000 pieces, an increase over 1908 of 30.3 per cent, and over 1907 of 72.6 per cent. The production of heading was 13.2 per cent greater than in 1908, and 32.2 per cent greater than in 1907, while there was an increase for hoops of 11.7 per cent over 1908 and a decrease of 23.4 per cent from 1907. In point of value the output of slack cooperage stock during 1909 amounted to \$20,242,000, which was an increase over 1908 of 19.8 per cent and over 1907 of 28.1 per cent.

Cotton Goods. In the consumption of cotton in the United States, according to the Census Bureau, the State of Massachusetts ranks first, North Carolina second, South Carolina third, Georgia fourth, New Hampshire fifth, Alabama sixth, and Rhode Island seventh. Of the three most important cotton-consuming States, North Carolina shows a loss of 13 per cent in the consumption of cotton in the cotton year 1910, as compared with 1909, South Carolina a loss of 10 per cent, and Massachusetts a loss of 7 per cent. Georgia, which ranks fourth in consumption, shows a loss of 8 per cent.

The statistics of spindles in the report relate to the year ending 31 August, except those for 1910, which have been compiled from returns of manufacturers for the census of 1909 and relate, as a rule, to 31 Dec 1909. The number shown for 1910 is 29,188,945, and exceeds the number for 1909 by 611,848, or only 2 per cent. The comparatively small number of spindles added since 1907 is attributable in part to the unsatisfactory condition of the cotton-manufacturing industry, which began with financial depression of that year and culminated in the more acute condition brought about by the shortage in the supply of cotton the past season. Massachusetts exceeds every other state in the number of cotton spindles, having 9,835,610, or 34 per cent of the total for the country. South Carolina ranks second, with 3,793,387, or 13 per cent, and North Carolina third, with 3,124,456, or 11 per cent. Rhode Island has fourth place, Georgia fifth, New Hampshire sixth, Connecticut seventh, New York eighth, and Maine ninth. No other state reports as many as a million spindles.

Cotton Seed Products. In the cotton seed industry, the number of establishments increased from 357 in 1899 to 809 in 1909, or 127 per cent. This increase in number has been

very general throughout the several states, oil mills having been established quite rapidly in new cotton-growing territory as well as multiplied in the older communities.

The quantity of cotton seed crushed during the last decade increased only 54 per cent, but the increase in the cost of the seed to the manufacturer was 173 per cent, and points to a greatly improved source of revenue for the producer, as the value of cotton seed per ton at the census of 1899 was returned at \$11.55 and the value at this census is reported at \$20.41 per ton. The increase in the total value of crude products during the decade is shown to be from \$42,412,000 to \$107,538,000, or 154 per cent.

While the increase in the quantity of seed crushed was 54 per cent, the production of oil increased 70 per cent, indicating the employment of better methods and greater economy in the use of machinery; natural resultants from the economic progress of the industry. The increase in the quantity of cake and meal is shown to have been 89 per cent, which is probably accounted for in part by the establishment during the decade of a number of mills operated under the "cold-process" system, by which the hulls and meats are pressed together and disposed of as cake and meal.

The states showing the greatest development in the industry, as indicated by the actual increase in number of establishments, are: Georgia, where the number has grown from 46 in 1899 to 145 in 1909, or 215 per cent; Texas, from 102 to 191, or 87 per cent; and South Carolina, from 48 to 102, or 113 per cent. Texas leads in total value of products, with 23 per cent of the output of the whole country; Georgia, Mississippi, South Carolina and Alabama follow in order.

Fisheries. A census of fisheries is attended with more difficulties than that of any other industry canvassed by the Bureau of the Census, calling as it does for the number of persons employed and the investment in vessels, outfits, boats, and apparatus of capture, both ashore and afloat, as well as the quantity and value of all commercial products of the seas, lakes, and rivers. The number of persons employed in the industry of the United States in 1908 was 143,881, the capital invested was over \$42,000,000, and the value of the product was about \$54,000,000. The total investment in apparatus of fish capture, such as nets, seines, lines, etc., was about \$9,000,000.

The canvass as regards the number of men and vessels employed and the amount of capital invested, shows an increase over figures for the last canvass.

The value of the fisheries of the United States was the largest on record, amounting to over \$54,000,000, with a total weight of almost 2,000,000 pounds. The oyster product leads all other species in value, contributing almost 30 per cent of the total value of products. Salmon ranked next to oysters in the value of the catch, being the leading species of fish in this respect. The catch of cod is third in value, amounting to almost \$3,000,000, followed by that of shad, lobsters, clams, and a great many other varieties of fish products. The decline in the value of products of the whale and menhaden fisheries is marked, while large gains are shown for the value of products in the general fisheries and the sponge fisheries. The oyster fisheries show

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a general increase in value of products. Fish proper formed over three-quarters, or 76 per cent, of the quantity and more than half the value, 56 per cent, of the entire products of the fisheries of the United States in 1908. The value of the products taken by the fisheries of the Atlantic coast is nearly double that of all of the rest of the country combined, being 66 per cent of the total of the United States. The Pacific coast ranks next in the value of its catch, with 13 per cent of the total. The Gulf of Mexico, the Great Lakes, and the Mississippi River with its tributaries contributed, respectively 9, 7 and 6 per cent of the total value.

The relative rank of the several leading States in order of value of fish products for 1908 was. Massachusetts with a total of over \$7,000,000, or 13 per cent of the value of the catch of the entire country, Virginia with over \$4,700,000; New York with \$4,549,000, Washington with \$3,513,000, Florida with \$3,389,000; Maryland with \$3,306,000, Maine with \$3,257,000; followed in ranking order by New Jersey, Connecticut, California, etc.

The trade with foreign countries in fisheries products for the fiscal year 1907-08 was extensive, amounting to a total of nearly \$20,000,000, the exports being \$6,166,193 and the imports \$13,135,724. The imports consisted mainly of herring, canned sardines, mackerel, and lobsters. The exports were composed chiefly of salmon and oysters. Fresh fish formed but a small part of either exports or imports, the product of the fish canning and preserving industry figuring most prominently in the foreign trade.

Oilcloth, Linoleum, and Artificial Leather. The number of establishments engaged in these industries in 1909 was 40, and the capital represented was \$21,844,000. Thirty plants are engaged in making oilcloth and linoleum, and they are distributed as follows: Illinois, 1; Indiana, 1; Maine, 2; Massachusetts, 2; Michigan, 3; Minnesota, 1; New Jersey, 10; New York, 4; Ohio, 3; and Pennsylvania, 3. In 1909 the total value of the product was \$22,805,000, an increase of 54.2 per cent.

It is not possible to present comparative statistics for prior censuses for artificial leather, for the reason that previously the industry has not been treated separately. The 10 plants are located as follows: Connecticut, 1; Massachusetts, 3; New Jersey, 4; New York, 1; and Rhode Island, 1.

Artificial leather is used for a variety of purposes, affording an excellent inexpensive substitute for leather in bookbinding, upholstering carriage and automobile work, etc. There were 11,819,000 square yards manufactured during 1909 and its value was given as \$3,449,000, which, added to the value of certain by-products of the industry, amounting to \$166,000, makes the value of products \$3,615,000.

Paper and Wood Pulp. There were 787 establishments reported as being engaged primarily in the manufacture of paper and wood pulp. There were 761 of the same class in 1904 and 763 in 1899. Of the establishments for 1909, 83 were engaged exclusively in the manufacture of pulp; 542 in the manufacture of paper; and 162 in the manufacture of both paper and pulp. In addition to the 787 establishments in 1909, there were 15 that manufactured paper in connection with other products, such as roofing materials, asbestos products, etc. The total

cost of pulp wood, wood pulp, and other paper stock used in 1909, amounted to \$107,607,000, which is a gain of 143 per cent, as compared with \$44,321,000 in 1899. The total cost of pulp wood consumed increased from \$9,838,000 in 1899, to \$33,802,000 in 1909, or 244 per cent. The total quantity of wood pulp consumed in the industry increased from 1,173,000 tons in 1899 to 2,834,000 tons in 1909, or 142 per cent. In 1909, of the total quantity of wood pulp used, 1,590,000 tons were returned by the establishments as "made for own use," and 1,244,000 as "purchased."

Silk and Silk Goods. The very remarkable development in the silk industry during the last decade is to be seen in the increase in the number of establishments, which grew from 483 to 843, or 75 per cent, and in the cost of the principal materials, including raw fibers and yarns, which increased from \$58,093,000 to \$98,372,000 or 69 per cent. The quantity of raw silk used increased from 9,761,000 pounds in 1899 to 17,471,000 pounds in 1909, or 79 per cent, while the corresponding increase in the cost of this material was 66 per cent. Spun silk as a material increased 43 per cent in quantity and 42 per cent in cost. The rapidly increasing use of artificial silk is a distinct feature in the recent history of the industry. The quantity of this material used in 1899 amounted to 6,000 pounds, compared with 876,000 pounds in 1909. Artificial silk is used chiefly in the manufacture of braids and trimmings, and, because of its greater brilliancy, it is even preferred to natural silk in certain kinds of passementerie.

The gross value of products increased from \$107,250,000 in 1899 to \$196,425,000 in 1909, or 83 per cent, and the increase during the 5-year period since 1904 was 47 per cent. The greatest gain was made in the manufacture of dress goods, which more than doubled in quantity and value during the 10 years. Their value constituted 55 per cent of the total value of products in 1909; that of ribbons, 17 per cent; velvets and plushes, 7 per cent; and laces, braids, and trimmings, 5 per cent.

Of the 843 establishments engaged in this manufacture, there were 566, or 67 per cent of the total, in New Jersey and Pennsylvania. The former State leads in the number of establishments with 347 showing an increase of 167, or 93 per cent, since 1899. Pennsylvania ranks second and gained 98 establishments, or 81 per cent, while New York, with the next largest number of mills, gained 76, or 83 per cent. In the order of value of products the States rank as follows: New Jersey, Pennsylvania, New York, Connecticut, Massachusetts, and Rhode Island.

The number of spindles increased from 1,655,903 in 1899 to 2,405,527 in 1909, or 45 per cent. Of the latter number, 2,275,700 are throwing and 129,827 are spinning spindles. The number of looms increased from 44,430 in 1899 to 75,406 in 1909, or 70 per cent. Of the total number of looms in the country, the combined returns from New Jersey and Pennsylvania constitute 73 per cent. New Jersey has about one-third of the number of spindles reported by Pennsylvania, but leads in the number of looms.

Sugar, Cane and Beet. There were 192 establishments engaged in the manufacture of cane sugar in 1909, 188 of these being in

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Louisiana and 4 in Texas. The quantity of cane treated in sugar mills in 1909 was 4,628,200 tons, valued at \$17,605,000, an average of \$3.80 per ton. The average quantity of cane treated per establishment in Louisiana is 23,660 tons, compared with 26,050 tons for Texas. Of the total quantity of cane treated, 57 per cent was returned as grown on farms and plantations under the control of the manufacturers and 43 per cent was purchased.

Of the value of products, that of sugar constituted 89 per cent of the total, molasses 9.6 per cent, and syrup 1.4 per cent. The total production of cane sugar was returned at 334,100 tons of 2,000 pounds, of which 325,500 tons, valued at \$26,017,000, were produced in Louisiana and 8,600 tons, valued at \$669,000, in Texas. The distinction made in this investigation between molasses and syrup is that the former includes the liquid product from which some sugar has been removed, while the latter includes the product from which no sugar has been removed.

The number of establishments engaged in making beet sugar was 65, an increase of 117 per cent during the decade, the number of acres planted in beets was 416,000, an increase of 207 per cent, and the quantity of beets produced was 3,965,500 tons, an increase of 399 per cent.

Turpentine and Rosin. The crop yield of spirits of turpentine in 1910 amounted to 555,000 casks, as compared with 580,000 in 1909, a reduction of 4 per cent. The production of rosin amounted to 1,906,000 barrels, each weighing 500 pounds, in 1910, as compared with 1,828,000 barrels in 1909, an increase of 4 per cent. The value of turpentine was \$17,680,000 in 1910, as compared with \$12,654,000 in 1909, an increase of 40 per cent. The value of the rosin production was \$18,255,000 in 1910 and \$12,577,000 in 1909, an increase of 45 per cent. The average price of turpentine was \$31.86 per cask in 1910, as compared with \$21.82 in 1909, an increase of 46 per cent. The average price of rosin, including all grades, was \$9.58 per barrel of 500 pounds in 1910, as compared with \$6.88 per barrel in 1909, an increase of 40 per cent.

In the turpentine industry the largest relative decrease, amounting to 32 per cent, was sustained in the Carolinas, the oldest producing territory. Georgia showed a reduction of 14 per cent, Alabama 18 per cent, and Louisiana 34 per cent. Florida, which ranks first, showed a gain of 8 per cent, and Mississippi a gain of 9 per cent, in value of production.

In the manufacture of rosin the largest relative decrease in total product, amounting to 51 per cent, occurred in Louisiana, although the decrease in value was only 34 per cent. North and South Carolina lost 17 per cent in quantity, but gained 14 per cent in value. Georgia's production decreased 4 per cent, but the value gained 37 per cent. Florida, the largest producer, gained 17 per cent in quantity and 60 per cent in value. Alabama's quantity was the same in both years, but the increase in value was 38 per cent in 1910. Mississippi

increased its production in 1910 by 10 per cent, but the value rose 62 per cent.

Veneer Material. Although veneer manufacture was engaged in during 1909 in practically every State in which lumber timber occurs in commercial quantity, nearly three-fourths of the material consumed during the year was reported from the 11 States of Illinois, Michigan, Florida, Indiana, Tennessee, Missouri, Arkansas, New York, Virginia, North Carolina, and Kentucky, ranking in point of quantity consumed in the order named. The outlay for veneer material, both domestic and imported woods, during the calendar year 1909 was \$6,436,237 in 1907. The number of establishments engaged in the manufacture of veneers during 1909 was 637, an increase of 235 and 267 over the number reporting in 1908 and 1907, respectively.

Woolen and Worsted Goods. The comparative figures in this report clearly indicate the remarkable development that has taken place in the industry since 1899. Although the number of establishments has decreased from 1,221 in 1899 to 913 in 1909, denoting a tendency toward concentration, which has been the rule in the wool manufacturing industry since 1870, on the other hand the amount of capital reported as invested shows an increase from \$256,554,000 in 1899 to \$415,465,000 in 1909, or 62 per cent during the decade. The cost of materials used increased 85 per cent and the amount paid in salaries and wages 58 per cent. The number of salaried officials and clerks increased but 47 per cent and the number of wage-earners only 29 per cent. The value of products increased from \$238,745,000 in 1899 to \$419,826,000 in 1909, or 76 per cent. The greater part of this increase took place during the second half of the decade; in fact, the increase of over \$100,000,000 in the five years since 1904 is far greater than that of any decade prior to 1900 in the history of the industry.

There have also been some interesting and important changes in the character of materials used during the past decade. The quantity of wool consumed, in condition purchased, increased from 330,179,000 pounds to 474,751,000 pounds, or 44 per cent; reckoned on a scoured wool basis, the increase was 50 per cent. The quantity of raw cotton consumed decreased from 40,245,000 pounds to 20,055,000 pounds, or 50 per cent, while the amount of cotton yarn purchased increased from 35,343,000 pounds to 39,169,000 pounds or 11 per cent. The net result is a decided decrease in the amount of cotton used as a material by wool manufacturers.

The figures also show a marked decrease in the use of shoddy. The quantity purchased decreased 35 per cent, and the amount manufactured in woolen mills for use therein fell off 10 per cent. In 1899 the total amount of shoddy consumed by woolen and worsted manufacturers was 68,663,000 pounds; in 1909 it was only 53,621,00 pounds, a decrease all the more significant when the growth of the industry is considered.

BIRTH REGISTRATION

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Acting on the principle that vital statistics are the foundation of scientific public-health work, the Census Bureau, through Doctor Wilbur, began in 1908 the collection of statistics of births with a view of establishing a provisional birth registration area. This work has steadily progressed until at the present time the tentative area includes the New England States, and Pennsylvania, Michigan and the District of Columbia, although the latter, which is coextensive with Washington City, whose laws are made by the direct action of Congress, does not register all its births. In fact, it is stated, the only state in which a determined effort has been made to enforce thoroughly the registration of births, as the law provides, with prosecution and infliction of the penalty of the law in delinquent cases, is Pennsylvania.

The statement notes that it may be surprising and even humiliating to the average

American citizen to learn that this country is far behind most foreign nations in regard to vital statistics, and that there is not a single State, nor even a single city, in the entire United States which possesses a complete registration of births. Boston claims to have the best, but only 96 per cent complete, while probably the most worthless registration of births among all the cities of the entire world, it is stated, may be claimed by Baltimore, Chicago, and New Orleans.

Although foreign countries register practically 100 per cent of their births, it was decided by the Census Bureau, when it began to establish the provisional registration area, that the high standard abroad could not be maintained in the United States. In fact, for the states whose vital statistics and records are now reported to the Census Bureau, the minimum accuracy accepted is 90 per cent.

